

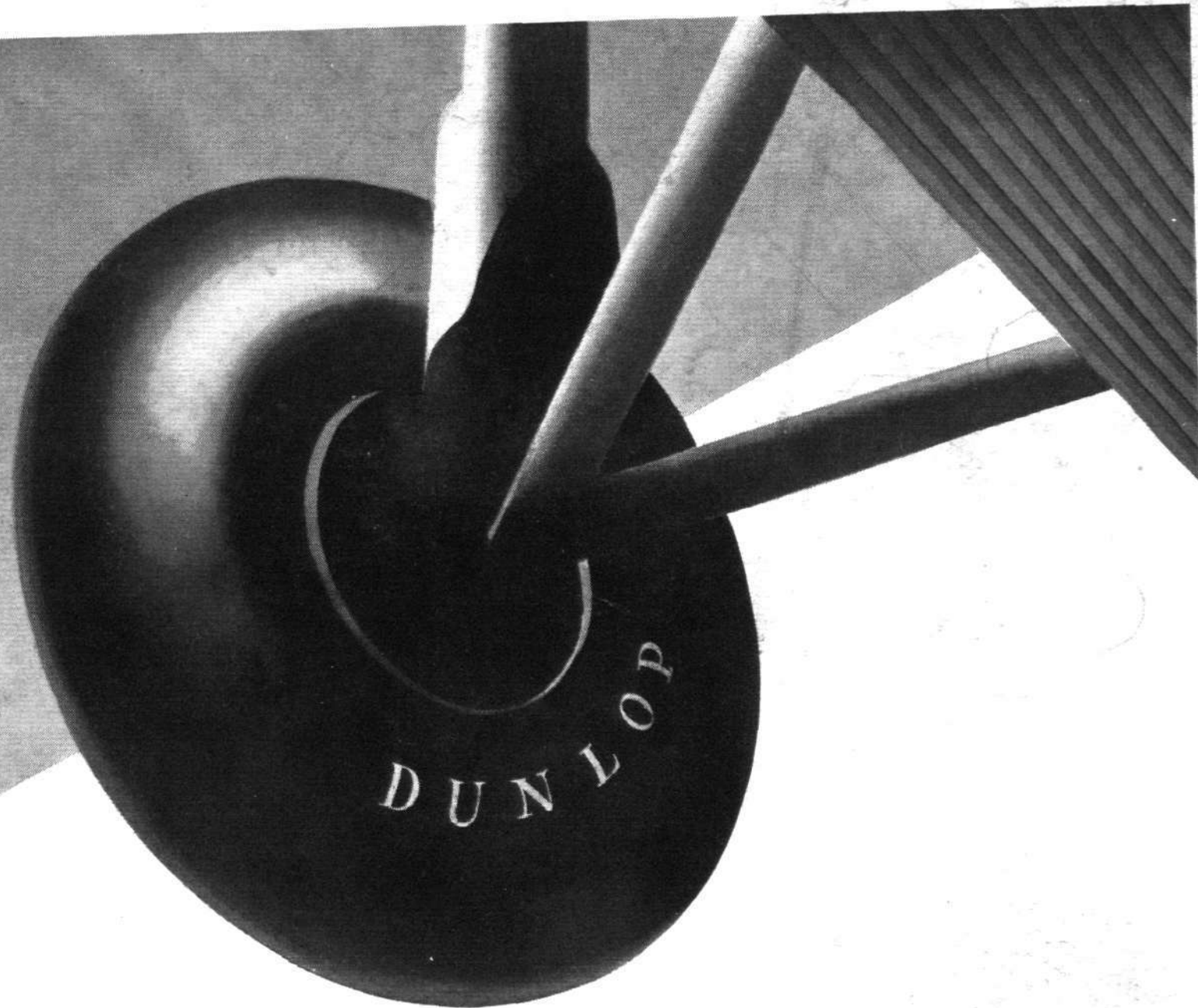
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The
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AND AIRSHIPS

No. 1358
Vol. XXVII

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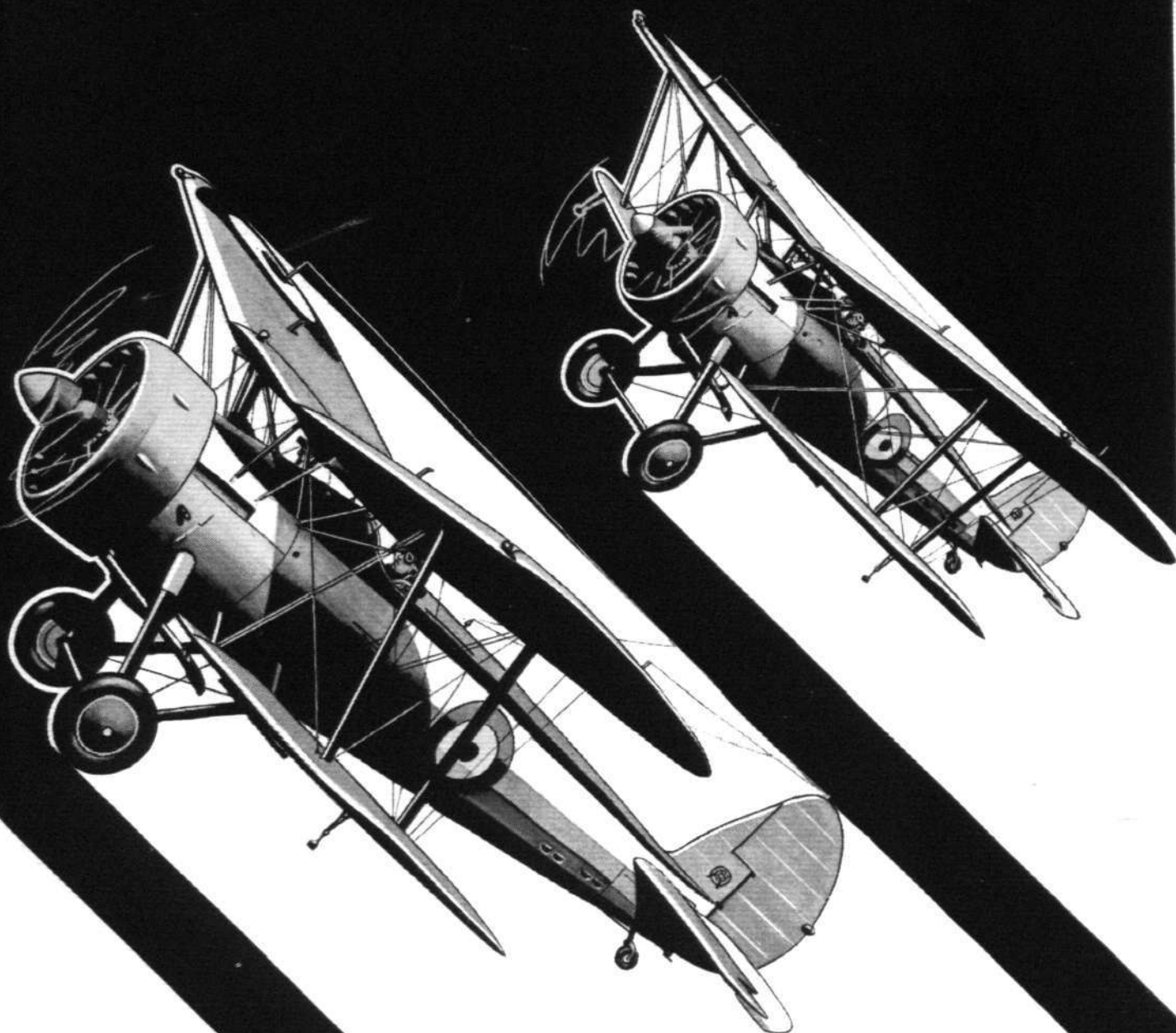


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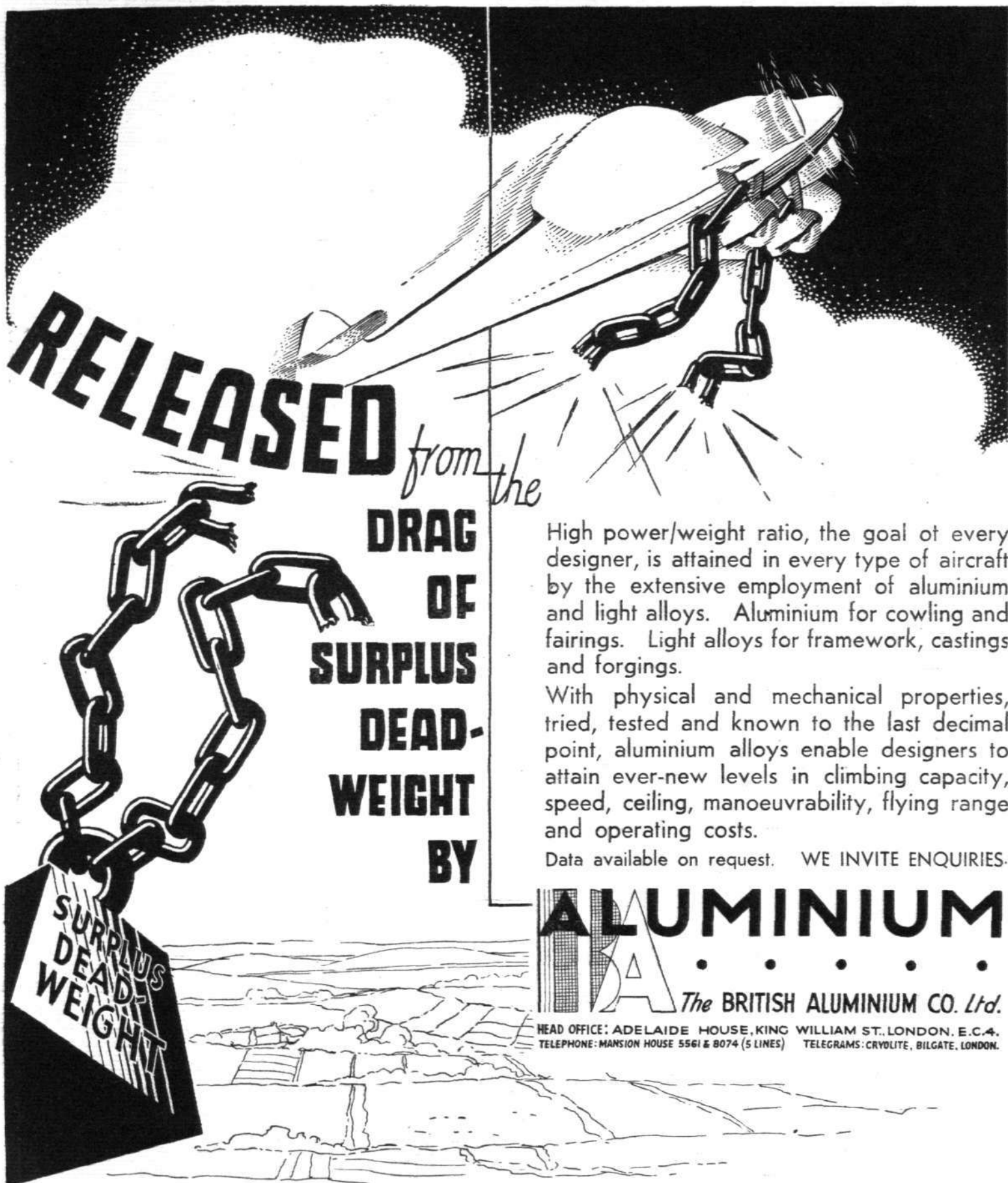
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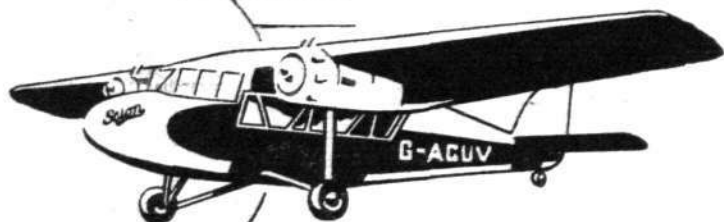
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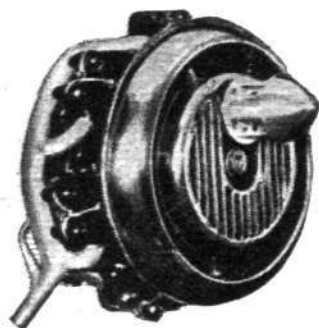
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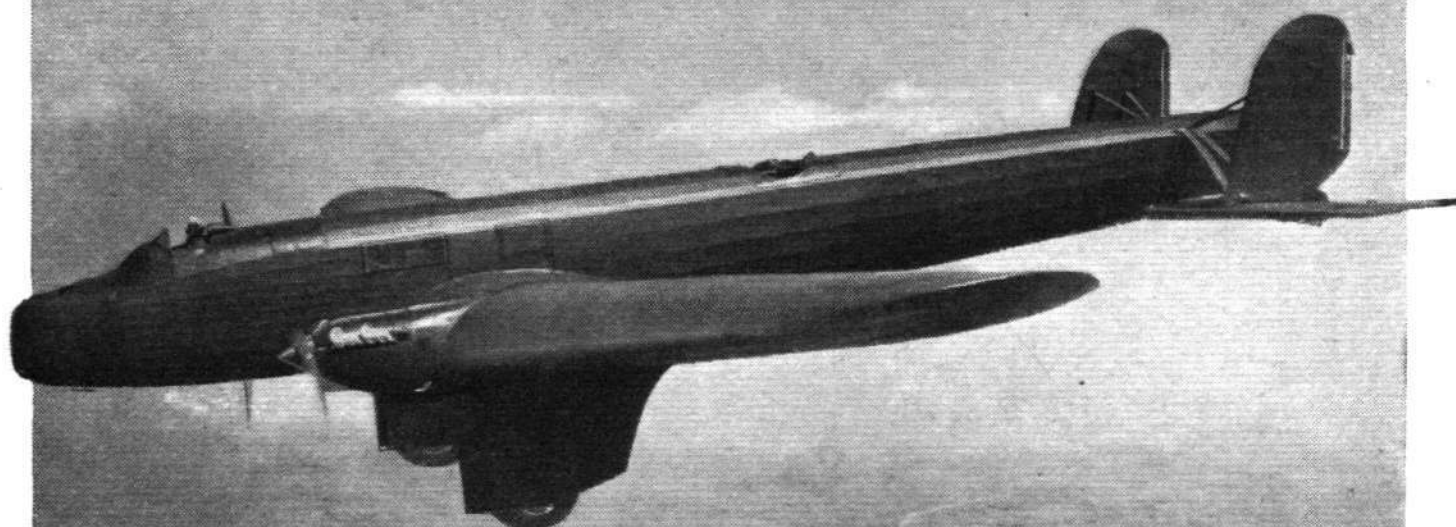


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The Old and the New

JANUS, as our readers may remember, was the Roman god from whom the month of January takes its name. He was a god with two faces, an old one looking back on the year that was past and a young one looking forward to the year just begun. Inevitably thoughts of past and future throng to the mind at the beginning of a New Year. "The year is dying in the night; ring out, wild bells, and let it die," wrote Tennyson. *Flight* is by no means inclined to bid such a careless farewell to *Annus Domini* 1934, for, on the whole, it has been a good year for the world of aeronautics. Our readers will forgive us if we retrospect a little.

Both in the sphere of civil flying and in that of the Royal Air Force the past year has seen corners turned. To take the civil side first, the outstanding event was the MacRobertson Race from Mildenhall to Melbourne, and the triumph of the "Comet." We need not recount the facts, for they are fresh in the memory of all our readers, but once again we must pay tribute to the designers of the "Comet," probably the most efficient civil aeroplane ever produced. It was no light task to fulfil the conditions set by the race—a range of 3,000 miles, a cruising speed of over 200 miles an hour, and ability to lift the weight "over the screen" in accordance with I.C.A.N. regulations.

We cannot forget the depression felt in British flying circles when the race conditions were first published, for then we possessed no aeroplane which had a chance of winning. The event seemed a gift for some foreign machine, and a foreign victory would have been a poor celebration of the centenary of Victoria State. Yet we must feel very thankful to Sir Macpherson Robertson, K.B.E., for having made the race an international affair, for by so doing he stimulated our British designers to give of their best. The De Havilland firm took up the challenge, and produced the only machine in the world which could fly non-stop to Baghdad at the requisite speed.

There has followed the decision of the Government to increase the speed and frequency of Imperial Airways' services to India, Australia, and South Africa. The programme has been published only recently, and we need not repeat the details. The greatest novelty in that programme is the intention to send by air all first-class mail matter to the Empire countries on the route, without leaving the onus of choosing the means of conveyance to the writer of the letter. It is hoped, too, that the initial postage shall be the same for all parts of the Empire—a very wise and far-sighted policy. In our delight at this great Empire programme we are inclined to forget that inland air mails are now to be sent by air at the discretion of the Post Office without extra charge. Yet this, too, was a boon for which many have hoped but which few have expected.

Confidence

In the all-important matter of defence, the year has seen the Government decide to increase the Air Force considerably and fairly rapidly. Again, we need not repeat facts which have recently been published, but we must once more register our thankfulness at the decision. Our Air Force, as the Prince of Wales said, makes for confidence, not only in the Empire but in the world. Not least, it makes for confidence in the United Kingdom. There can be no confidence unless our country is as a strong man armed, keeping his house.

Side by side with our satisfaction at the decision to be prepared, we rejoice to think of all the encouragement which both the civil and Air Force programmes will give to our much-enduring aircraft firms. In the recent years of depression it has been melancholy to hear of staffs of skilled draughtsmen and skilled engineers being reduced, possibly some of the men thrown on the dole. There will be much employment in the aircraft and engine factories in 1935 and the following years. At that we may all rejoice.

The designers will have a particularly busy time, for performance of both civil and military aeroplanes must be improved, and ever improved. The machines which

will take passengers to India in two days, to Cape Town in four days, and to Australia in seven days have not yet been designed. At the same time, it is pleasant to think that more pilots will find employment. Civil flying has hitherto been a profession in which the supply of pilots has exceeded the demand. Everyone knew that the profession had a future before it, but that future has continued to recede before the eyes of men who had done their five or six years in the Royal Air Force and wanted a "job" to keep body and soul together. At least a few dozen more will be absorbed before long. It is an improvement for which we are thankful. The young face of Janus is smiling as he looks to the future.

Wheel Brakes

CURIOSLY enough, although practical flying is now something like twenty-five years old, it was not until comparatively recently that wheel brakes became anything like standard fittings on aeroplanes. Yet it might have been thought that the aeroplane would need brakes at least as much as other vehicles. It seems likely that the universal adoption of the tractor aircraft principle may have had something to do with the long delay. On a "pusher," with a low-placed fuselage projecting forward, and possibly with a front wheel or skid under it, the risk of

nosing over when applying the brakes is small. Probably the early designer was afraid that, if he fitted wheel brakes, the machine would turn on its nose. In actual fact, the tendency to do so has not been found nearly so great as was expected, and a slightly more forward placing of the wheels has reduced this tendency almost to vanishing point on most aeroplanes.

In the early days of wheel brakes it was customary to fit treaded tyres, the theory being that they would give a better grip and so increase the braking efficiency. This was not found to be the case on British grass-covered aerodromes, and the smooth tyre has come into general use. Certain troubles were encountered during the development period. For instance, it was found that the heat generated by applying the brakes was liable to damage the inner tubes. Modern technique has overcome this and other difficulties, and there are now on the market several satisfactory makes of wheel brakes for aircraft, the leading examples of which are reviewed elsewhere in this issue. It will be seen that aircraft wheel brakes fall into two classes: those with metal brake shoes operated mechanically, and those in which the braking elements are applied by pneumatic or hydraulic means. Within these two classes there is plenty of scope for individual treatment, and our article describes the interesting ways in which several manufacturers have attacked the problem.



ACCLAMATION: Mr. Ken Waller and M. Maurice Franchomme surrounded by a sea of excited and appreciative humanity on their return to Brussels after their remarkable mail flight in the D.H. "Comet," *Reine Astrid*, to the Belgian Congo and back. As described on page 7, they made the round trip in forty-eight hours' flying time.

The Outlook

A Running Commentary on Air Topics

An Honour Deserved

THE grant of an O.B.E. to Flt. Lt. W. R. May, D.F.C., of the Royal Canadian Air Force, recalls one of the most dramatic incidents of the great war. On his first flight across the lines on April 21, 1918, May, then a second lieutenant in No. 209 Squadron, R.A.F., was almost killed by Baron von Richthofen, and, in fact, would almost certainly have fallen a victim had not Capt. Roy Brown, D.S.C., his Flight Commander, shot the German leader dead at the critical moment.

No. 209 Squadron, flying "Camels," had engaged some fifteen Fokker triplanes and Albatros scouts led by von Richthofen in person. Two of the Fokkers had been shot down when May found himself clear of the dog-fight, but with the red triplane of Manfred von Richthofen close on his tail. May dived down almost to the ground, kicking his rudder bar to prevent his enemy from getting his sights on, and Richthofen closely followed each of his turns, waiting for his chance. Capt. Brown dived to the help of May—who, incidentally, had been at school with him at Edmonton, Alberta—and just in time got in a burst of fire from behind the red triplane. One of the bullets hit Richthofen on the right side (he seems to have turned in his seat to see the danger behind) and passed through his body, killing him instantaneously. The triplane dived into the ground behind the British lines. The incident was witnessed at close quarters by Lt. (now Sqd. Ldr.) F. J. W. Mellersh, of the same squadron, who had been chased down by two other German machines. Brown then drove those two off (after seeing their great leader killed they had no more heart for fighting), and Brown, Mellersh and May returned to their aerodrome together. The dog-fight lasted about twenty minutes, and the only British casualty was one pilot wounded.

Since then, May (familiarily known as "Wop" May) has done fine work in Canada. A few years ago he was awarded the Transcontinental Trophy as the Canadian pilot who had done the best work in civil flying during the year.

Instrument Operation

AEROPLANES operating on scheduled air lines, both internal and international, nowadays habitually take off in bad weather, when the visibility is only a very few yards—far less than would have been considered practicable only a very few years ago. This necessitates flying from the start of the take-off run almost entirely by instruments.

Up to the present, British practice has been to operate special navigation instruments, such as gyroscopic turn indicators, by means of a venturi tube placed outside the aircraft. This system was discarded in America and other countries quite a long time ago. The venturi is an excrescence, and therefore produces drag and decreases speed, and it is also susceptible to ice formation and stoppage from other reasons.

What, however, is perhaps even more important is the fact that the aeroplane must have attained flying speed for quite an appreciable time before the instrument functions satisfactorily. When used, as it was some years ago, for flying through clouds—that is, when the machine had taken off and climbed up to a cloud layer under conditions which did not require the immediate use of the instrument—this slow-starting drawback was not of much

account, but its elimination is now becoming very important indeed. The system generally adopted in America is of working the instruments from a chamber kept in a state of vacuum by the suction from the engine induction system. One or two British aircraft have already been fitted in this manner, and it is to be hoped that something of the sort will become a standard practice before very long.

Other Excrescences

THE removal of venturi tubes is undoubtedly a help in cleaning-up an aeroplane externally, but there are other similar "bits and pieces" which in foreign countries have been streamlined or put inside the machine, but which are often found outside on British commercial aircraft. There is the electrical generator for wireless and general lighting purposes. It is true that some English manufacturers are incorporating drives for this particular piece of equipment behind their engines, but far too often we find the old-fashioned wind-driven type.

Wing-tip flares and landing lights are also capable of modernisation. The former can fairly easily be designed so that they retract cleanly into the bottom surface of the wing, while the latter can be placed in the leading edge of the wing behind a transparent panel conforming to the surface of the wing. Tail skids as well, although perhaps not quite so important, can be made retractable without very great difficulty.

An Opening

THERE appears to be a new opportunity for young men in the aviation industry, and it lies in a combination of the jobs of ground engineer and wireless operator. There is a rapidly increasing number of private owners of comparatively large aircraft, most of whom employ a pilot and many also carry their own ground engineer. It would make the pilot's job easier, and at the same time keep the ground engineer occupied while in the air, if the latter were also a fully qualified wireless operator.

Owners of this type of aeroplane generally want to go far afield in the world, and wireless equipment is therefore almost essential. Hitherto the pilot has done the operation, but where he also has the navigation to do he could very profitably be relieved of the wireless.

Why Not Models?

MANY years' attendance at flying club functions has made the sight of silver cups almost painfully familiar. Sometimes these trophies are things of beauty, sometimes not: in both cases, however, they often become white elephants for the recipients, whose wives do not look kindly on the idea of loading the sideboard with them. In fact, we have often heard the remark: "I don't know what I am going to do with the darned thing."

Why is it that donors of these trophies show so little originality? Why don't they, for example, give one of the really beautiful silver aircraft models which can now be obtained?

MODERN WHEEL BRAKES

Advantages of the Differential Systems of To-day : Leading Designs Reviewed and Explained

DUE to the comparatively high landing speed of the majority of modern aeroplanes, it is obvious that some means whereby the run on the ground may be reduced at will is of great advantage. Almost equally desirable, especially in single-engined aircraft, is the ability to manoeuvre into any required position without the manual aid of a ground crew. Both these requirements can be met by brakes applied—independently in the latter case—to the wheels of the aeroplane.

Other uses of brakes quickly suggest themselves. Chocks are rendered unnecessary for the "running up" of an engine, and, consequently, mechanics are not required to dodge beneath wings and round airscrews.

The extent to which brakes can be safely used in shortening a landing run is surprisingly great; in an emergency, with certain types of machine, the wheels can be locked without too great a risk of nosing-over, provided the tail is down and the surface is a fairly smooth grass one.

As has been demonstrated with certain military aircraft it is possible to open up the engine fully with the brakes on and to shorten the take-off run considerably by suddenly releasing them. It is obvious, too, that brakes may be used to great advantage by deck-landing aircraft. After a machine has touched down on the deck of an aircraft carrier, and rudder control is no longer available, it is possible to keep it on a straight course by judicious use of the brakes.

The Two-shoe Type

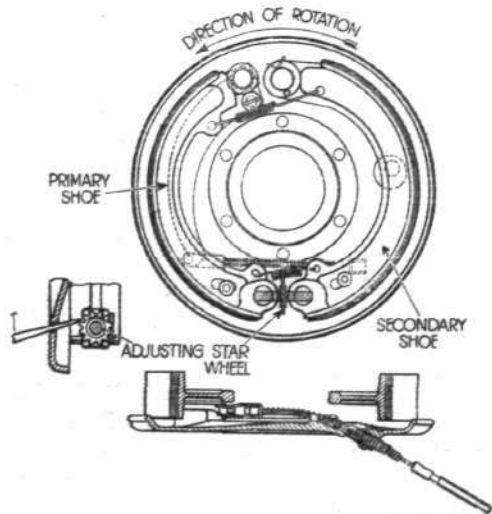
The advantages of brakes have been apparent since the early days of flying, but for many years attainment of efficiency in design eluded even the best brains concentrating on their development. Only in the last few years have systems capable of everyday employment made their appearance. Four well-known arrangements are described in the following pages.

Similar in action to the well-known Bendix motor car brake, the Bendix aircraft brake, known as the "two-shoe servo" type, is so constructed that it utilises the forward rotation of the wheel to assist its application. Basically, the operation is as follows: A rocking lever is provided with a square cam block bearing on the toe of a primary shoe, which it forces against the brake drum. Friction causes this drum to rotate the primary shoe in



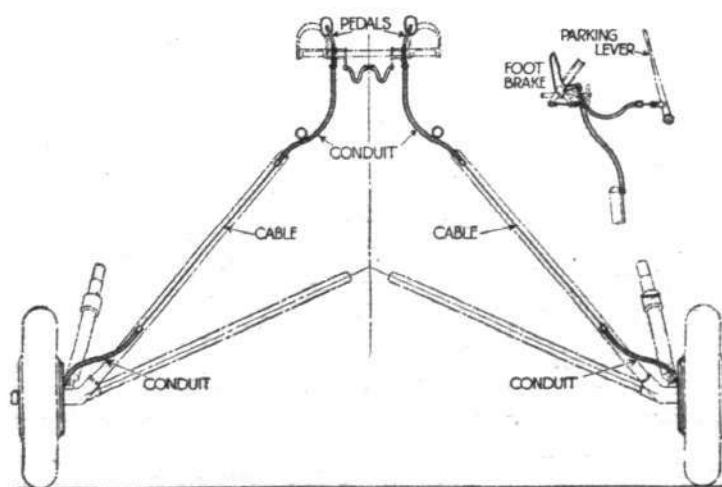
the direction of the rotation of the wheel, an articulating link conveying the pressure from the primary shoe to the secondary shoe. The latter pivots on an anchor pin, through which the braking torque is transmitted to the back plate. As the pedal pressure is expended entirely on the primary shoe, the action of the secondary shoe does not increase the pressure required, thus making for ease of control. All the braking torque is transmitted to the landing gear through the back plate, which is bolted to the flange of the axle.

The Bendix brake is operated mechanically by a cable and conduit system. Provided that bends are not too acute, this system can be used throughout between the pedals (or hand lever) and the brakes; but if it is necessary that the cable should pass round an acute bend, a pulley must be employed. Usually, the cables can be arranged so that there is practically a straight run from the brake to the rudder-bar pedals. The flexibility of the conduit



(Left) Details of the Bendix drum, showing the method of adjustment.

(Right) Simplicity is the keynote of the Bendix cable-operated system.





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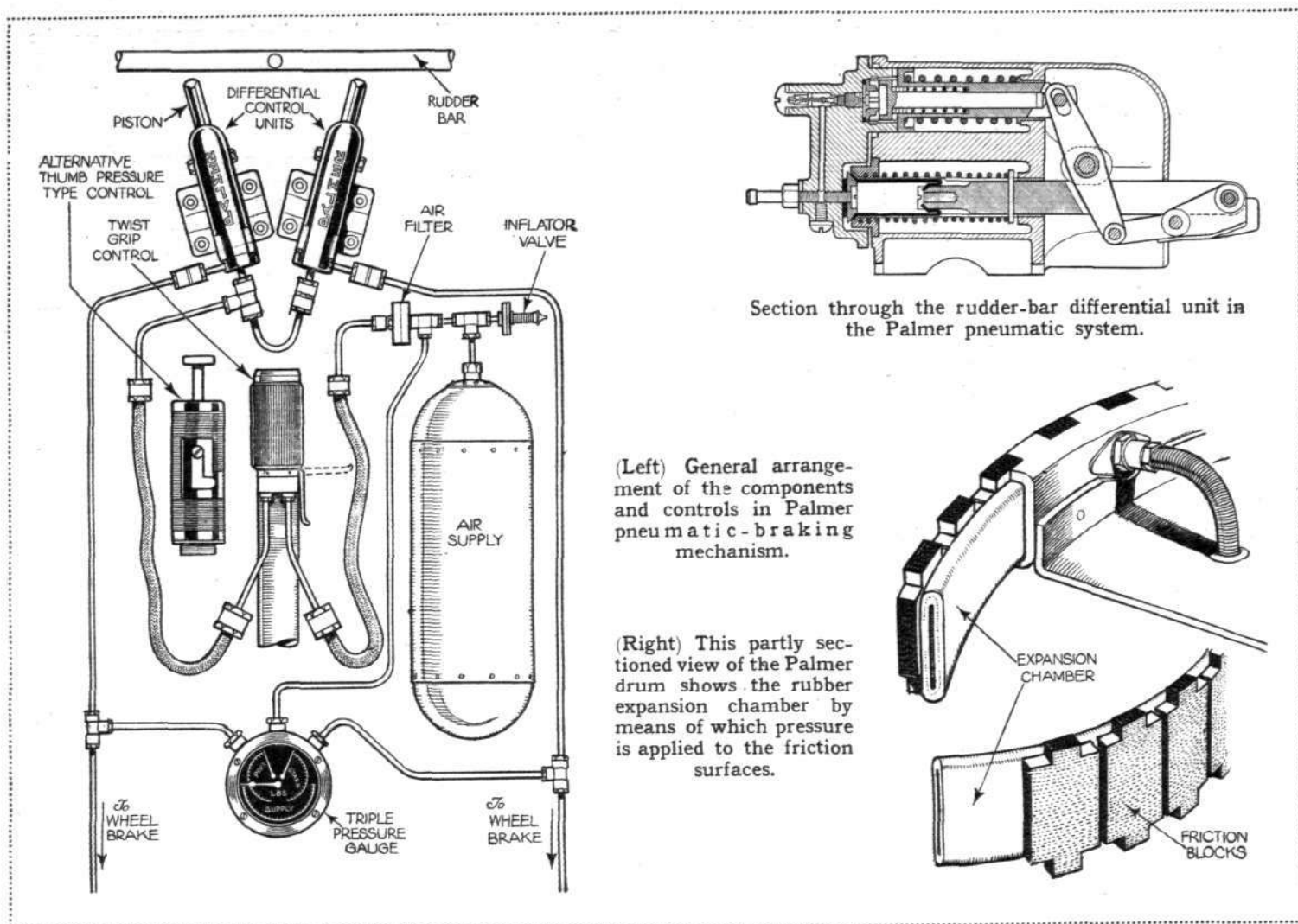


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system avoids mechanical complication, as it leaves the brake operation unaffected either by the normal movement of the rudder bar or by adjustment of the bar for leg-room. A parking control, too, is easily installed.

The various working parts are adequately lubricated during the assembly of the brake, and no further lubrication should be necessary between the periodic overhauls of the machine except in the case of the cables, for which a grease gun is employed. It is claimed that there is a definite progressive "feel" to the brakes, and that no difficulty is experienced in obtaining maximum brake power.

"Pneudraulic" Types

For a long time one of the main disadvantages of brakes operated by compressed air was leakage of air in the system. In the Dunlop pneumatic type this disadvantage has been virtually overcome, and the makers state that their design may be safely depended on for use as a parking brake.

The Dunlop unit (see p. 6) is compact, and consists of an annular expansion chamber or air bag, which, when inflated, presses the brake blocks radially outwards against the brake drum of the wheel. These blocks are located by metal clips which pass through slots in the annular ring. When it is required to release the brake the blocks are positively re-

turned to the "off" position by springs disposed at intervals round the drum.

One small lever, which can be mounted in any position on the aircraft to suit the designer, controls the brake gear.

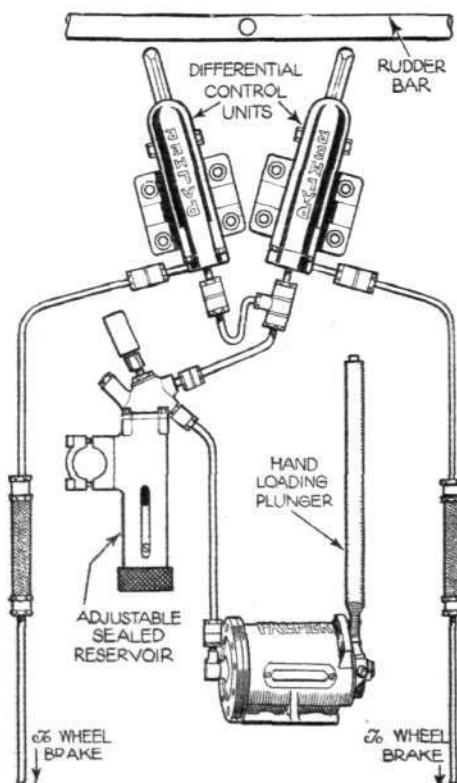
Usually, it is found most convenient to attach this lever to the control column, where it can be applied without affecting in any way the pilot's control of the machine during landing, and leaves his left hand free to operate the throttle.

Differential control is obtained by directly linking a dual relay valve to the rudder bar or pedals. Thus, when the brakes are applied by the master control and the rudder is in the "straight-ahead" position, both wheel brakes are applied with equal pressure. Movement on the rudder bar then decreases the braking effect on one wheel and increases it on the other.

This alteration of the braking effect is progressive and smooth, and does not interfere with the pilot's ability to release both brakes entirely, by means of the hand lever, should the necessity arise.

The differential action of the brakes can be observed by the pilot on a neat triple pressure gauge mounted on the dashboard. One pointer indicates the pressure in the compressed-air container, and the other two indicate the pressure in each wheel brake.

Of exceptional simplicity, the Palmer fluid-pressure aeroplane wheel



General arrangement, in diagrammatic form, of the Palmer hydraulic system.

brake consists of only two parts, the brake frame and the brake liner. The brake constitutes an annular expansion chamber to which is attached a complete ring of brake blocks, which, when the brake is in operation, are forced into frictional contact with the brake drum. The pressure required for even a considerable braking effort is small, owing to the fact that there is nearly 100 per cent. contact between the brake blocks and the drum; and, as the pressure exerted is uniform over the whole area, the drum itself can be made lighter than those normally employed with the ordinary shoe-type brake. Wear on the brake blocks is negligible.

The brake drum support is machined perfectly circular and concentric with the wheel before the drum is placed into position, so that the distortion of the drum during the process of wheel-building and truing is impossible. Should small distortions occur as the result of shock while in use, the efficiency of the brakes is unimpaired, as the expansion chamber to which the brake blocks are attached "breathes" in sympathy with any small irregularities in the drum. The friction surfaces can be renewed by lifting out the liner and dropping another in its place.

Optional Methods of Control

Operation of the Palmer brake may be either by pneumatic or hydraulic pressure, and in each case there are numerous optional methods of control. Generally speaking, for small types of aircraft the hydraulic system has been found more suitable, while on large machines air is generally adopted, as it is usually available from the supply used for engine-starting purposes. The principal methods of operation are: (a) hydraulic or pneumatic, with foot-operated individual control to each wheel; (b) pneumatic, with hand-operated control to each wheel; (c) hydraulic or pneumatic, hand-operated, with differential rudder bar control; (d) dual-control, hydraulic or pneumatic, for installation in training machines. In all cases pressure is conveyed to the brakes through a small pipe-line of aluminium, copper, or rubber. Special Palmer fluid is used in the hydraulic system, supply being maintained from a small reservoir.

When operated by fluid, the brakes can be applied by

means of two small pumping cylinders mounted on the rudder bar in such a position as to allow easy operation with the toe or heel.

Although the pedals do not, upon release, recover instantly, the pressure falls to zero at once, the slow recovery being due to the flow back of fluid used to take up clearance between the brake lining and drum. A "parking" lever may be mounted in any convenient position.

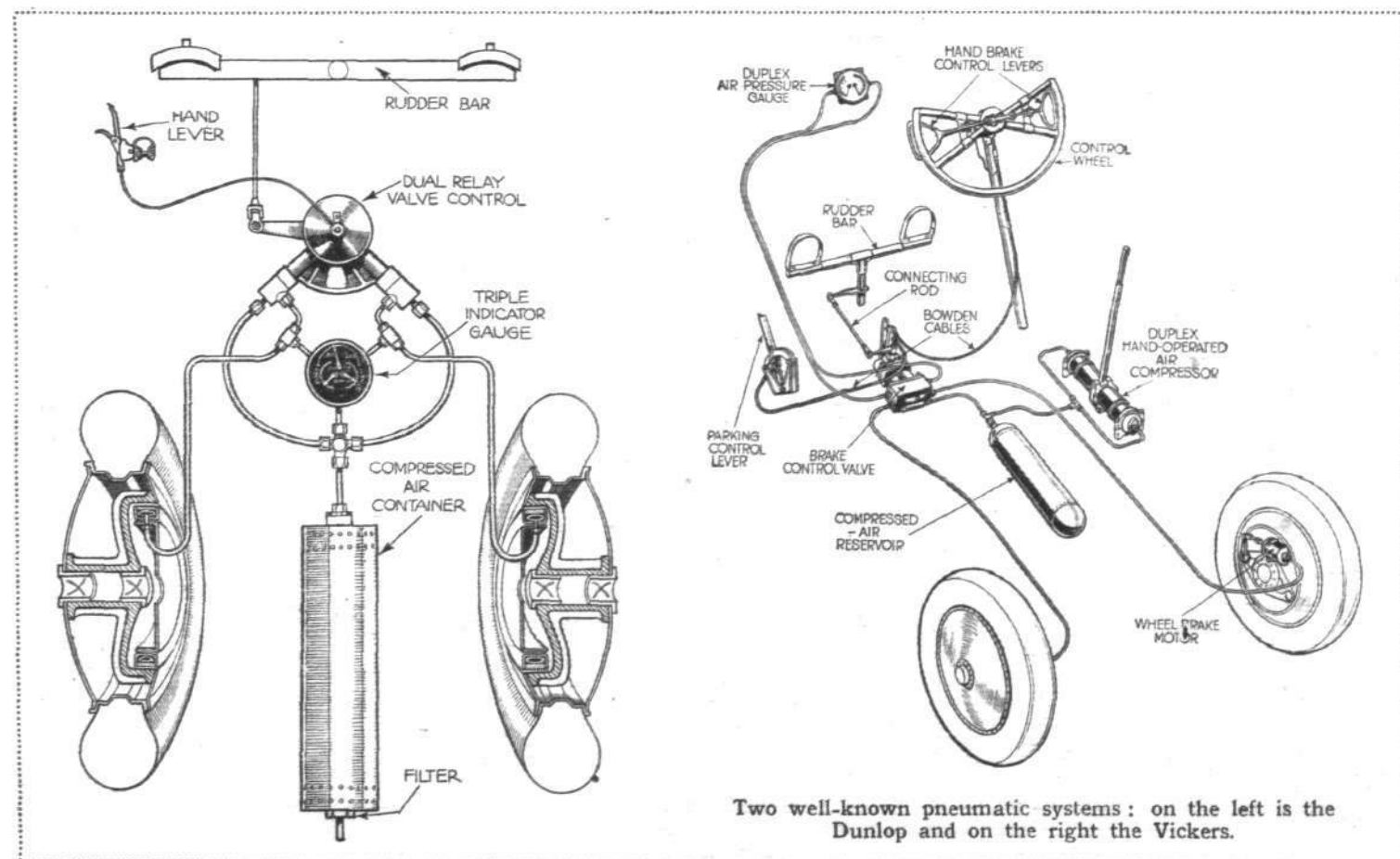
In another type of pedal control, known as the "sealed" system, the fluid is under a small initial pressure.

With hydraulic hand-operation plus a rudder-bar differential system (which provides directional control on the ground by moving the rudder bar in the normal way), if the pilot finds it necessary to land with a certain amount of "rudder" to prevent his machine swinging and then to apply his brakes, the latter will not be differentiated. They will be applied equally to both wheels, giving a straight run until the rudder bar is centralised, when the operating mechanism comes into action, thereafter varying the braking effort according to the rudder applied.

Single-lever Differential Control

Control of Palmer pneumatic brakes may be effected by a foot-operated relay valve, making the application and release of the brake as gradual as desired. Another method is to mount two of these valves together and operate them by a common hand-lever giving differential action. A straight pull on the lever applies both brakes, and movement to one side or the other gives a differential action. Yet another method of control for pneumatic operation is hand application, with rudder-bar differential action for steering. Straight braking is applied by a twist-grip-operated relay valve on the control column, or through the medium of any suitable type of Bowden lever and control.

Differential action for manoeuvring on the ground is provided by two pistons operated by the rudder bar; these are retracted when not in use. Again, remote control for differential units by a dummy rudder bar linked to the main bar and similar to that for the hydraulic system can be supplied. Upon application of the brakes, the pistons of the rudder-bar units extend immediately, and then differentiate the braking effort at the wheels, according to the



Two well-known pneumatic systems: on the left is the Dunlop and on the right the Vickers.

direction and in proportion to the amount of rudder applied.

Last, but not least, we come to the Vickers system. Here compressed air is adopted, because, say the makers, it is light and clean, can readily be stored under pressure, and its expansive properties permit its use at closely governed pressures, and enable relay valves with light operating loads to be used.

The chief components are: (a) the hand brake lever, which may be mounted on the control wheel or column, and is connected to the relay valve which governs the brake pressure and provides for differential braking for steering; (b) the parking control, which locks the brakes; (c) the wheel brake units; and (d) the air-storage reservoir, pipe lines, pressure gauges, hand air compressor, and engine-driven air compressor.

The hand brake lever may be fitted to any type of control wheel. It operates directly on the mechanism of the brake controller, which is, in effect, a sensitive duplex relay valve. This valve admits air to the port and starboard brake groups at a pressure corresponding to the load on the hand lever. The valve is also connected to the

rudder bar, and during a turn the pressure in the brakes on the outer wheel is released. The maximum pressure which can be admitted to the brake motors is governed by adjustable stops.

Often it is necessary to use very high braking pressures in order to hold a machine against the engine thrust when "running up." Special stops are provided on the valve with which the independent or parking control operates in conjunction. This parking control is kept independent of the normal hand control to prevent inadvertent use. The wheel-brake units are of the two-shoe automobile type, the cam being operated by an external motor. All adjustments may be made externally. This type of brake, the makers state, will give maximum retardation up to 30 per cent. of the weight of the machine, and it is possible to increase this figure to 40 per cent. for parking and engine testing.

These, then are the leading systems, and the foregoing notes will serve to show how great is the progress made in the last few years. Perfection of existing details, rather than a search for entirely new methods, seems likely to mark braking development in the immediate future.

BY "COMET" TO THE CONGO

*Another Successful Flight : Mr. Ken Waller and M. Maurice Franchomme
Fly from Brussels to Leopoldville and Back in Forty-five Hours*

CARRYING 300lb. of Christmas mail in the *Reine Astrid*, Bernard Rubin's renamed D.H. "Comet,"

Mr. Ken Waller and M. Maurice Franchomme reached Leopoldville on the Saturday before Christmas and were back in Brussels on the following Friday, December 28. The eight thousand miles were covered in less than forty-five hours' flying time.

They left Brussels at 10.45 a.m. on December 20, and arrived at Oran, Algeria (1,118 miles) that afternoon, after averaging 235 m.p.h. On the following day their average was rather lower (209 m.p.h.) to Niamey, French West Africa, and they reached Leopoldville at 2.50 p.m. on December 22, having covered the whole distance in 22 hr. 35 min. flying time. Actually, some two and a half hours were lost in storm conditions during the last stage, when they found it advisable to land near Black Point—where the aerodrome is a mere 400 yards square—for fuel. Soon after leaving Niamey, while flying in the dark, the storm provided them with "bumps" in which altitude changes were as great as 2,000 feet at a time and with a fifty-mile-an-hour head wind.

Notwithstanding the extraordinarily high average put up over the first section of the outward journey, the weather then was all but impossible. The "Comet" was flown out of Brussels aerodrome with a visibility of less than a mile and under a 700-foot ceiling. The pilots flew blind for an hour and a half up to 13,000 feet and then for yet another hour up to 15,000 feet. Thereafter, apart from a solitary mountain-top, Barcelona was the first sign they saw of Mother Earth. The Mediterranean was crossed at an average of 280 m.p.h.!

At Leopoldville they received a telegram of congratulation from the King and Queen of the Belgians, and Mr. Waller spoke for the benefit of the Brussels broadcasting station.

At 4.0 a.m. on the following Wednesday the *Reine Astrid* left for Brussels, carrying 4,000 letters and a silk flag from the people of Leopoldville, and arrived again at



Mr. Ken Waller, whose remarkable flight to the Congo is described on this page. (Flight Photograph.)

Niamey at 11.40 a.m. The airmen had averaged 195 m.p.h. for the 1,525 miles. After being forced back with slight engine trouble that afternoon they left at 6.40 a.m. on the following morning, and, making a stop at Colomb Bechar, flew over the Atlas mountains to Oran.

The last stage—of 1,118 miles—was flown on Friday at an average speed of 224 m.p.h., and the "Comet" was landed at Evere, near Brussels, at 12.14 p.m. At the aerodrome Waller and Franchomme were mobbed by an enthusiastic crowd (see photograph on page 2), and it was some time before the British Ambassador, Sir Esmond Ovey, could approach and offer his congratulations. Gen. Gilleaux, commanding the Belgian Air Force, congratulated them on behalf of King Leopold, and on the following day it was announced that the Order of the Lion of Africa, honour, would be conferred upon Mr. Waller.

Belgium's highest

By comparison, and apart from the trouble at Niamey, the return journey had been without incident, though Mr. Waller found it necessary on occasion to fly right down "on the deck" when following the motor track across the Sahara, owing to bad visibility.

The flight was particularly interesting in that it showed what could be done with a fast machine flying in comparatively easy stages. The average daily hourage was no more than eight, yet the whole journey was accomplished in six days.

Tremendous enthusiasm was shown at all places; people were particularly interested in the English D.H. "Comet" and in facts rather than in "thrills." Only at Lympne, apparently, did the newspapermen ask for "human interest." King Leopold himself asked technical questions which all but baffled Mr. Waller!

The "Comet" is now to be prepared so that it will be fit to undertake any high-speed charter work at a moment's notice, and, until that moment arrives, will be kept at Lympne, where Mr. Ken Waller is an instructor of the Cinque Ports Flying Club.

THE FOUR WINDS

ITEMS OF INTEREST FROM ALL QUARTERS

Still in Circulation!

Seen recently in a train near London—a young man intently studying a copy of *Flight*—a 1910 issue!

Speed in Czechoslovakia

An Hispano-Suiza water-cooled engine of 650 h.p. has been fitted in a Czechoslovakian Avia 56 high-wing six-passenger monoplane and gives the machine a top speed of 224 m.p.h. Cruising at about 186 m.p.h., the range is 620 miles.

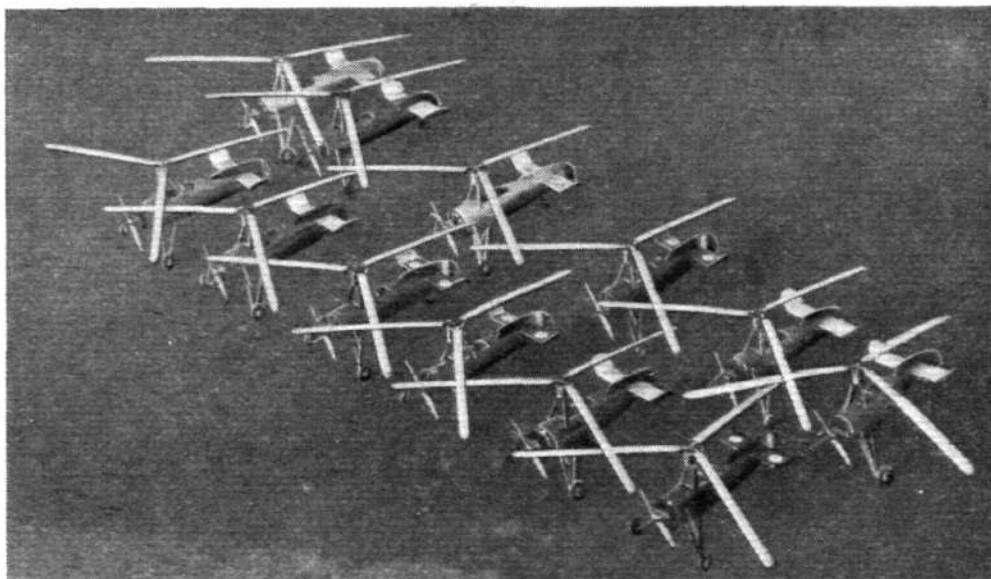
Over the Andes on One Engine

A Douglas D.C.2 (two Wright 710 "Cyclone" F.3s) belonging to Pan American Airways, recently made a single-engined crossing of the Andes. The machine, loaded to 16,500 lb., took off in a normal fashion on two engines, climbed to 15,000 ft., and on reaching the mountains one engine was throttled right back while the other was given full throttle. In this condition the machine crossed the mountains and landed at Mendoza, Argentina, after a flight of 45 minutes. At no time was the machine flying at less than 13,000 ft., or 2,000 ft. above the highest point in the pass through which the crossing was made.

Twenty-five Years Ago

From "*Flight*" of January 1, 1910.

"In view of the probability of a large number of town-to-town flights being made in the neighbourhood of Pau in the near future, the Aero Club of Bearn, of which M. Tissandier is President, has addressed a letter to the Mayors of the various towns in the district asking them to take some steps to afford facilities to aviators in this direction. It is proposed that the name of the town should be painted in white letters on a black background on the roof of the most prominent building."



A CHINESE PUZZLE: Not a swarm of insects, but an aerial view of the International (British, French, German and Spanish) Autogiros at Hanworth, referred to on page 13. (*Flight* Photograph.)

An Arctic Flight

Early this month the Russian pilot, V. S. Molokov, accompanied by G. T. Pobejimov, will make the first winter flight from Krasnoyarsk to Dixie Island via Igarka, Dudinka, and Ust-Post. A modified Russian P-5 machine will be used, and the conditions of the aerodromes in these areas will be inspected.

Performance of Boeing Bomber

The big Boeing Y1B-9A bomber monoplane (two 600 h.p. Pratt and Whitney "Hornets"), which caused something of a sensation when it appeared two or three years ago, but of which, until recently, little information was available, is now claimed by the manufacturers to have a speed of 186 m.p.h. at 6,000 ft. A ceiling of 21,900 ft. is obtained, the landing speed with full load being 68 m.p.h. Up to 2,500 lb. of bombs may be carried.

Vought "Corsair" in Portugal

A Vought "Corsair" V.90 two-seater military biplane with a 600 h.p. Pratt and Whitney "Hornet" engine has been sent to Portugal for demonstration.

Portuguese Flight Ended

Lt. Humberto de Cruz arrived back in Lisbon from Timor on December 21, thus completing his out-and-home flight in a "Puss Moth" to this Portuguese East Indian colony.

Antarctic Flight (of Fancy)

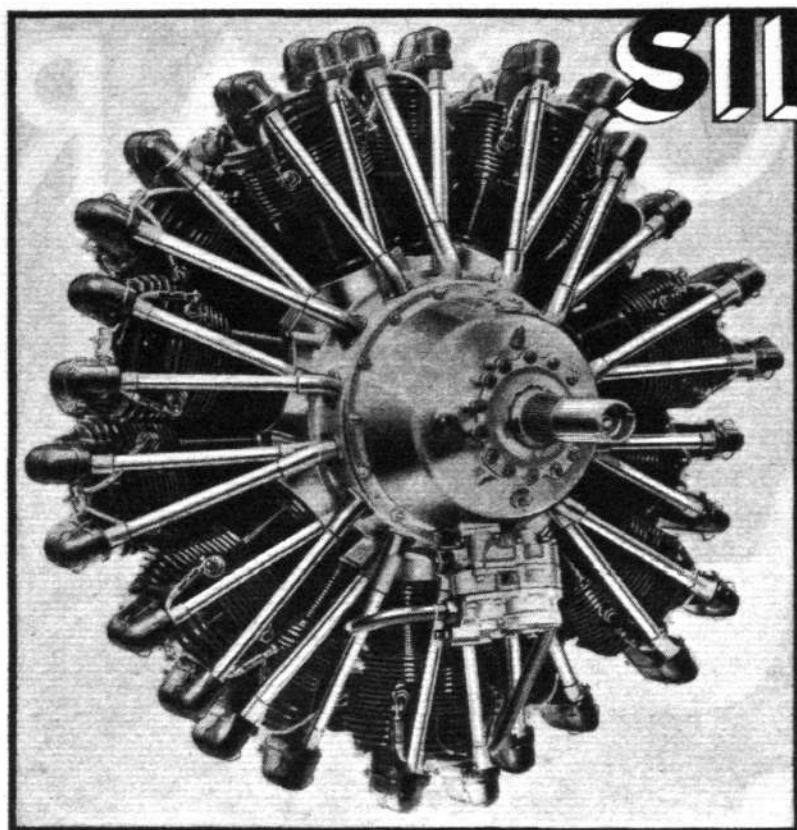
It was reported from Wellington, N.Z., last week that Mr. Lincoln Ellsworth and his pilot Mr. Berndt Balchen had flown 2,700 miles non-stop across the Antarctic from Deception Island to the Bay of Whales. Later, however, the report was stated to be "premature," and that the explorers were still at Deception Island!



A FINE FLIGHT: The K.L.M. Fokker, *Snip*, which, piloted by Mr. J. J. Hondong, left Amsterdam with Christmas mails on December 15, and, flying over the South Atlantic via Cape Verde Is., reached Paramaribo, Dutch West Indies, on December 17. It is here seen beside the Shell depot at Casablanca.



APPROPRIATE SUBJECTS : Their attractive appearance justifies this reproduction of some of the many Christmas and New Year greeting cards received by *Flight* from all parts of the world, many of them by air mail.



SIDDELEY

PANTHER ENGINE

LEADING DETAILS

Aircooled radial type. 14 cylinders. Moderately supercharged. Maximum flight power 625 h.p. at 6,700 ft. with a take-off power of 592 h.p. at sea level. The Panther engine is also available in a fully supercharged form.

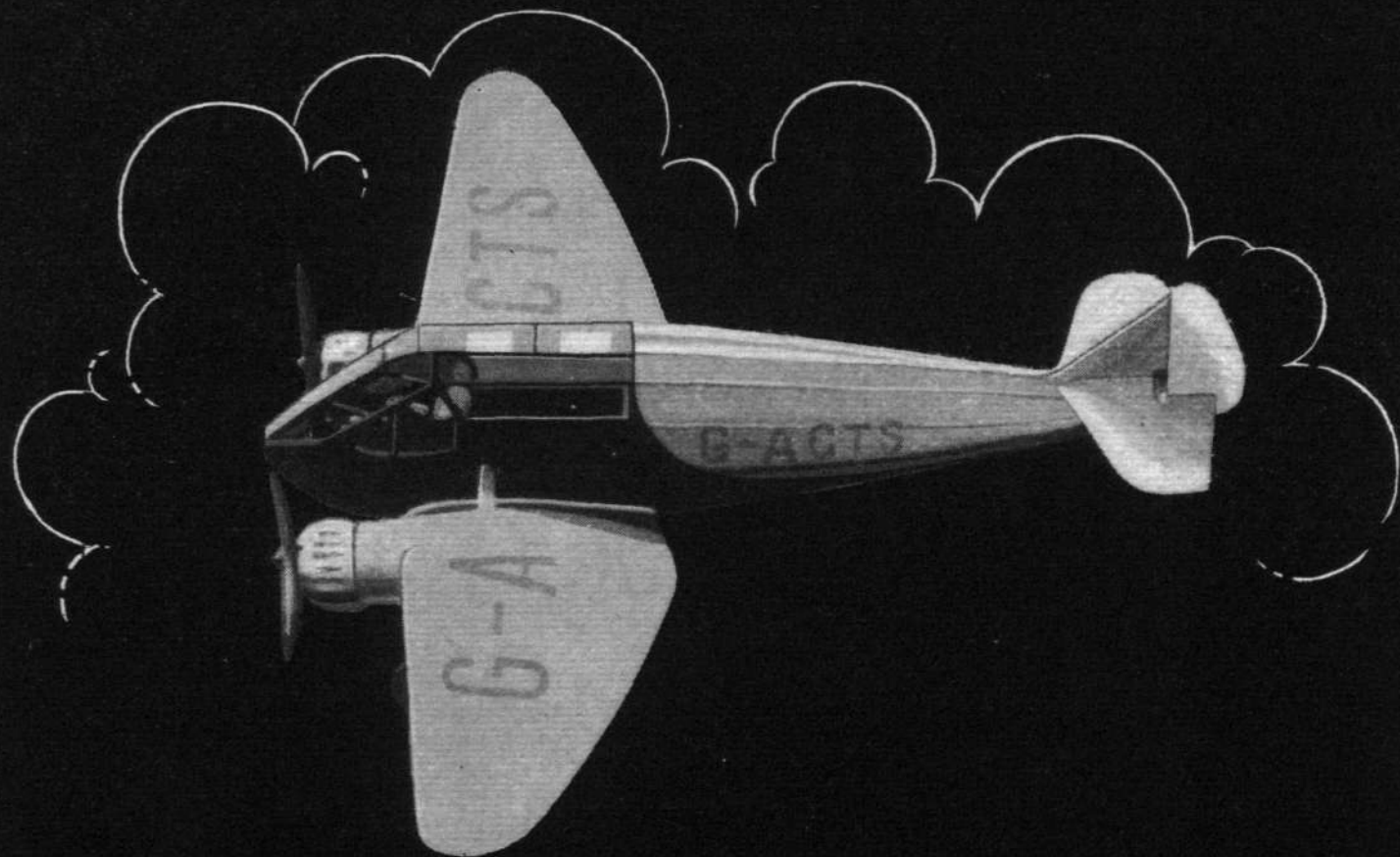
A Panther engined Fairey Seal seaplane of the Fleet Arm being placed on its catapult aboard one of H.M.'s. battleships.



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MONOSPAR



"MULTI-MOTOR-MINDEDNESS can alone give complete tranquility under all modern flying conditions. Prove it for yourself by trying one or more of the wide range of Monospar 4 place metal monoplanes now augmented by the Gipsy Major ST.12, specially produced to meet the demand for fast services over bad country or long sea crossings. Remarkable performance on one engine guaranteed.

A new model powered by the GAL.V.4 engine, offering much increased pay load and range, and a very attractive performance will shortly be introduced.

PERFORMANCE

ST. 4. 130 M.P.H.
TO
ST.12. 165 M.P.H.



"CHASSIS-BORNE"

PRICES:

ST. 4. £1,500
TO
ST. 11. £2,300

GENERAL AIRCRAFT LTD.

AIRPORT OF LONDON, CROYDON, SURREY

Owners and Lessors of

THE LONDON AIR PARK, FELTHAM, MIDDLESEX

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take a very considerable number of days, and, often, the port for which she is making has no knowledge of when a particular ship is going to arrive. If the place which an aircraft is leaving is in the grip of an epidemic, the airport for which the machine is bound could easily be warned.

Coming next to the consideration of more technical matters, I feel that this flight has shown quite conclusively that, for carrying out a serious job of work, a range of between 600 and 700 miles with a cruising speed of about 150 m.p.h. is absolutely necessary, and of these two things the range is more important. From my previous remarks it can be seen that the less time spent on the ground the better. Between Marseille and Baghdad the main stopping places are, more often than not, situated approximately 300 miles apart, and their geographical placing is frequently such that cutting off a corner to overstep one of them necessitates a flight of between 500 and 600 miles. This, when added to the head-wind, which must for safety's sake be anticipated by the provision of sufficient range, means fuel for approximately 700 miles. Also, of course, immunity from forced landings must be provided; the single-engined performance of the "Dragon" is admirable in this respect, provided the machine is not overloaded. Unfortunately, people who make journeys of this nature and can afford to maintain machines in this class naturally and rightly expect a considerably greater degree of comfort than is necessary on flights of far shorter duration. They therefore include more comfortable seating and considerably more equipment than is fitted in the standard machines, with the

result that both payload and range are decreased. I feel, therefore, that possibly the tendency in design for the six-passenger machine capable of doing the world-wide work of a man who runs a machine for business purposes may be to revert to the three-engined type.

The amount of equipment which is really necessary for a job of this nature is astonishing. A very full wireless installation for both telegraphy and telephony is important (in this connection it would seem that there is an opening for keen young ground engineers who are also expert wireless telegraphists). Again, the pilot must be prepared to fly above or in cloud, so, besides the wireless, he must have a full range of blind-flying instruments, and "if possible, an automatic pilot. The machine must, of course, be fully equipped with lights for night flying and for landing.

Another point which becomes of vital importance in hot countries is that of ventilation. The present systems of little spouts which blow a cold draught on the top of the passengers' bald heads lose none of their unattractiveness in hot countries, because very often the air sent through them is quite cool at high altitudes, so that colds are frequently caught. I feel that the general or complete ventilating system which deals with the whole of the cabin air is to be preferred, but it must be adequate, because nothing is worse in a hot country than a stuffy cabin.

It is to be hoped, also, that the use of engine silencers will before long become general, as even the best of machines in the class under discussion do not yet approach the silence achieved in larger air liners.

THE NEW YEAR HONOURS

Recipients in the World of Flying : Sir Macpherson Robertson a K.B.E.

A NUMBER of people well known in the aeronautical world appear in the New Year's Honours Lists made public last Tuesday. As will be seen from the names below, the recipients of Honours and Awards are mainly in the Service, though it will be noticed that Sir Macpherson Robertson, of Australia Race fame, has been granted a K.B.E. An O.B.E. is granted to Flt. Lt. W. R. May, D.F.C., of the Royal Canadian Air Force, and a note on a remarkable incident in the life of this officer appears on p. 3.

HONOURS

K.C.B. (Military)

Air-Marshal Sir John Miles Steel, K.B.E., C.B., C.M.G., Royal Air Force.

C.B. (Military)

Air Vice-Marshal W. Gore Sutherland Mitchell, C.B.E., D.S.O., M.C., A.F.C., Royal Air Force.

Air Commodore Charles E. H. Rathbone, D.S.O., Royal Air Force

O.B.E. (Military)

Sqd. Ldr. R. S. Grandy, Royal Canadian Air Force.

M.B.E. (Military)

Flt. Lt. A. A. Poole, Royal Australian Air Force.

K.B.E. (Civil)

Sir Macpherson Robertson, Kt.

O.B.E. (Civil)

F/O. C. Haggerton Dickins.
Flt. Lt. W. R. May, D.F.C., Royal Canadian Air Force (Reserve of Officers).

British Empire Medal

Flt. Sergt. H. Johnson Winney, Royal Canadian Air Force.

G.C.I.E.

F. Tymms, M.C., Director of Civil Aviation in India.

O.B.E. (Civil)

A. S. Lane, Chief Inspector of Aircraft, Civil Aviation Directorate.

AWARDS

The Air Force Cross

Sqd. Ldr. Vivian Steel Parker, D.F.C.
F/O. George Norman Snarey.
Sqd. Ldr. Douglas, Marquess of Douglas and Clydesdale, M.P., (Auxiliary Air Force).

The Air Force Medal

4490 Flt. Sergt. (Pilot) Frederick Neal Paxman.

Royal Red Cross (First Class)

Miss Winifred Eveline Molesworth, Matron, Princess Mary's Royal Air Force Nursing Service.

Diary of Forthcoming Events

Club Secretaries and others are invited to send particulars of important fixtures for inclusion in this list.

Jan. 7. "Imperial Air Routes." R.Ae.S. Lecture by Mr. F. Snowden Gamble.

Jan. 14. "Aerodrome Design." Lecture by Sir Leopold H. Savile, before the Institute of Transport (Inst. Electrical Engineers, Victoria Embankment, London, W.C.2).

Jan. 29. Newcastle-on-Tyne Aero Club Annual Dinner and Dance, Barras Bridge Assembly Rooms, Newcastle-on-Tyne.

Feb. 4. Jubilee Celebration of the Foundation of the City and Guilds College, Imperial College of Science and Technology.

Feb. 8. "Ice Formation in Carburettors." R.Ae.S. Lecture by Mr. L. P. Coombes.

Mar. 1. "Fuels for Aircraft Engines." R.Ae.S. Lecture by Mr. E. L. Bass.

Mar. 5. "Problems of Cold Presswork." Joint R.Ae.S. and Inst. A.E. Lecture by Dr. H. Gough and Dr. Desch.

Mar. 15. "New Developments of the Autogiro." R.Ae.S. Lecture by Senor Juan de la Cierva.

Mar. 29. "Piloting Commercial Aircraft." R.Ae.S. Lecture by Sqd. Ldr. H. G. Brackley.

Apr. 12. "Commercial Aircraft." R.Ae.S. Lecture by Capt. G. de Havilland.

May (Date not yet fixed). Wilbur Wright Lecture, R.Ae.S., by Mr. W. D. Douglas.



A NEW MONOSPAR

The "S.T.12," with two 130 h.p. "Gipsy Major" Engines : A New Type in the Well-known Monospar Range, Offering a Higher All-round Performance

IN the normal course of events, when a manufacturer produces some piece of apparatus—a car, aeroplane or fountain pen, for example—people rapidly become used to it, and then want something better. Ever since they were first brought out, the General Aircraft Company's Monospar aeroplanes have been improved from time to time, but without radical departure from their original sound layout; this design was so obviously what was wanted that there has been no demand for alterations.

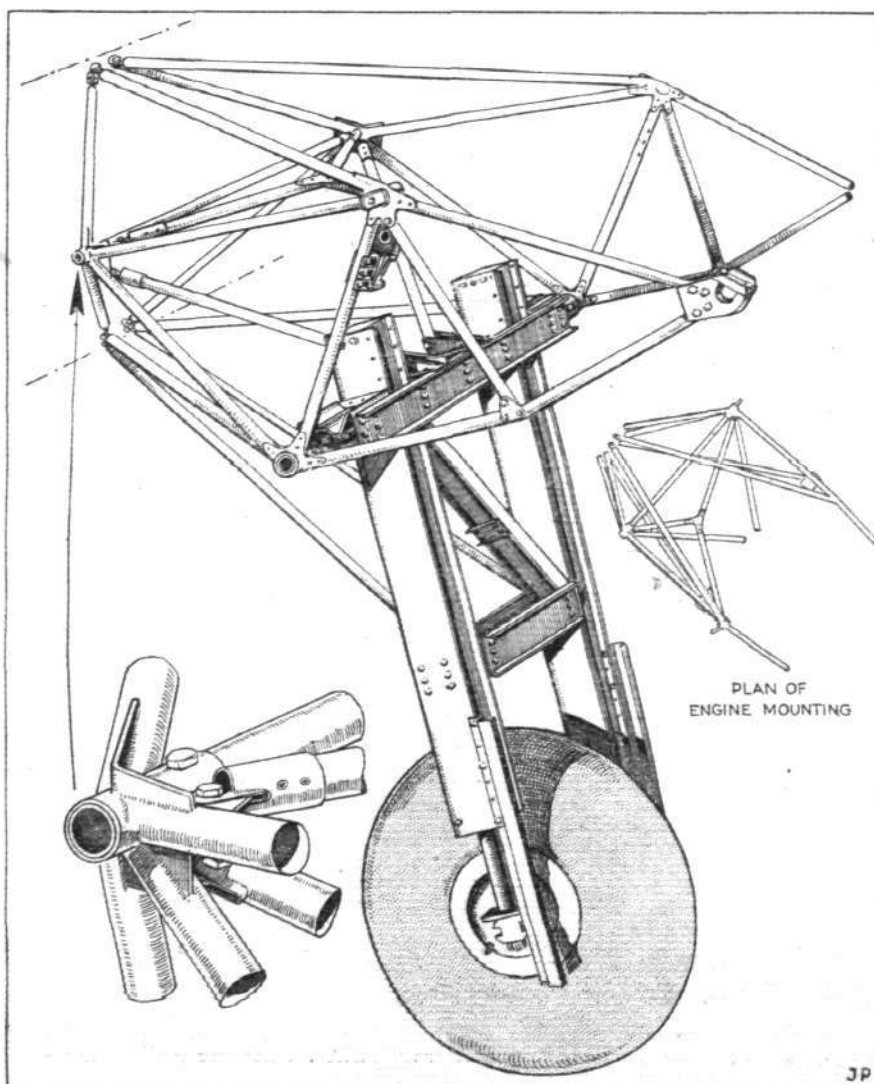
The "S.T.12" has been produced in response to those pilots who wanted a Monospar type with a better climb, a higher cruising speed, and an outstanding performance on one engine.

The Engine Mountings

A study of the table of performance figures on page 13 will show that these requirements have been met most successfully. The two 130 h.p. "Gipsy Major" engines have been mounted in a similar fashion to the Pobjoy engines previously used; that is to say, they are carried on steel-tube mountings projecting from the wing spars at a point in the stub wing just forward of the hinge which allows the wings to be folded. The undercarriage forms part of the mounting structure, and is, in effect, the retractable undercarriage of the "S.T.11," but permanently extended. It is covered with a "trouser" form of fairing.

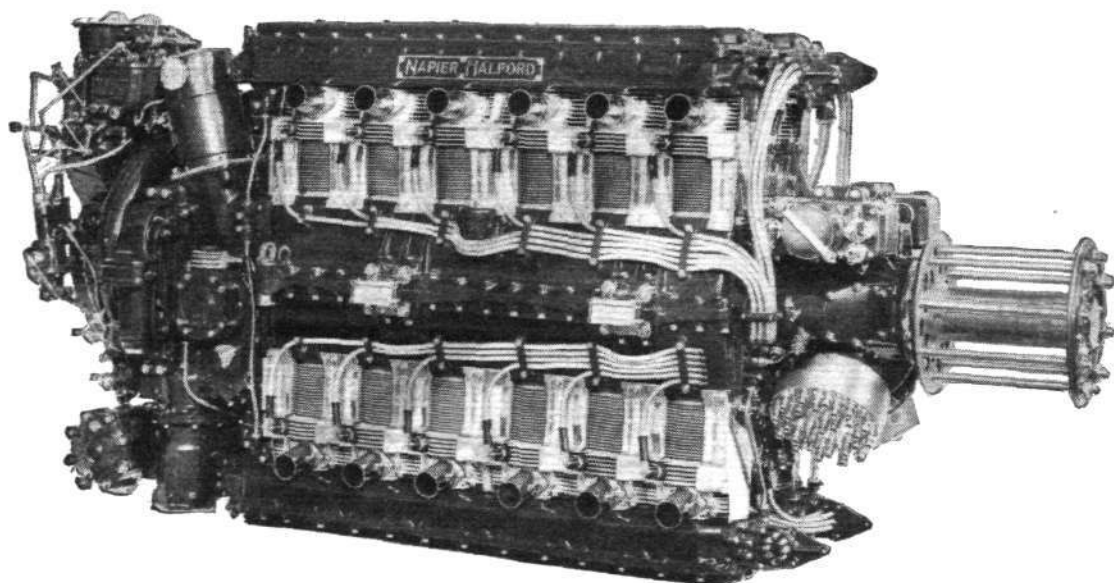
Already a considerable amount of flying has been done with this new type, and it has been found that not only are the take-off and climb fully up to expectations, but that the good control when flying on one engine—a charac-

teristic for which the earlier Monospar models were famed—has been retained. In other respects the "S.T.12" is similar to the "S.T.10," which was fully described after it had won the King's Cup Race last year in such a spectacu-



In this view are shown the essential features of the structure which combines the engine mounting and the undercarriage. Both sides are identical. The shock-absorbing rubber blocks are carried in each of the rectangular undercarriage legs.

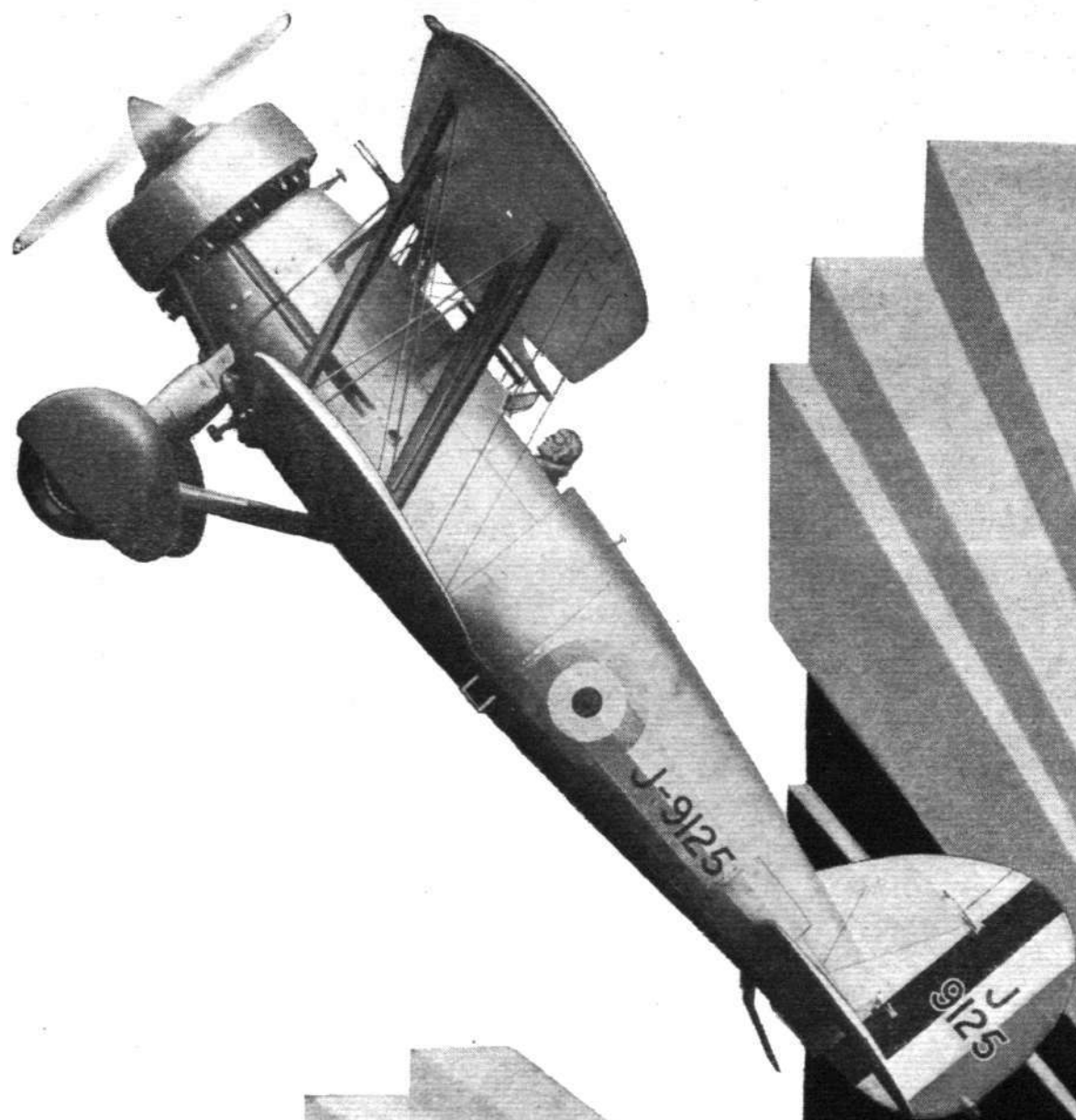
Dagger



The **NAPIER-HALFORD**
AIR-COOLED AERO ENGINE

D. NAPIER & SON, LIMITED, ACTON, W.3.

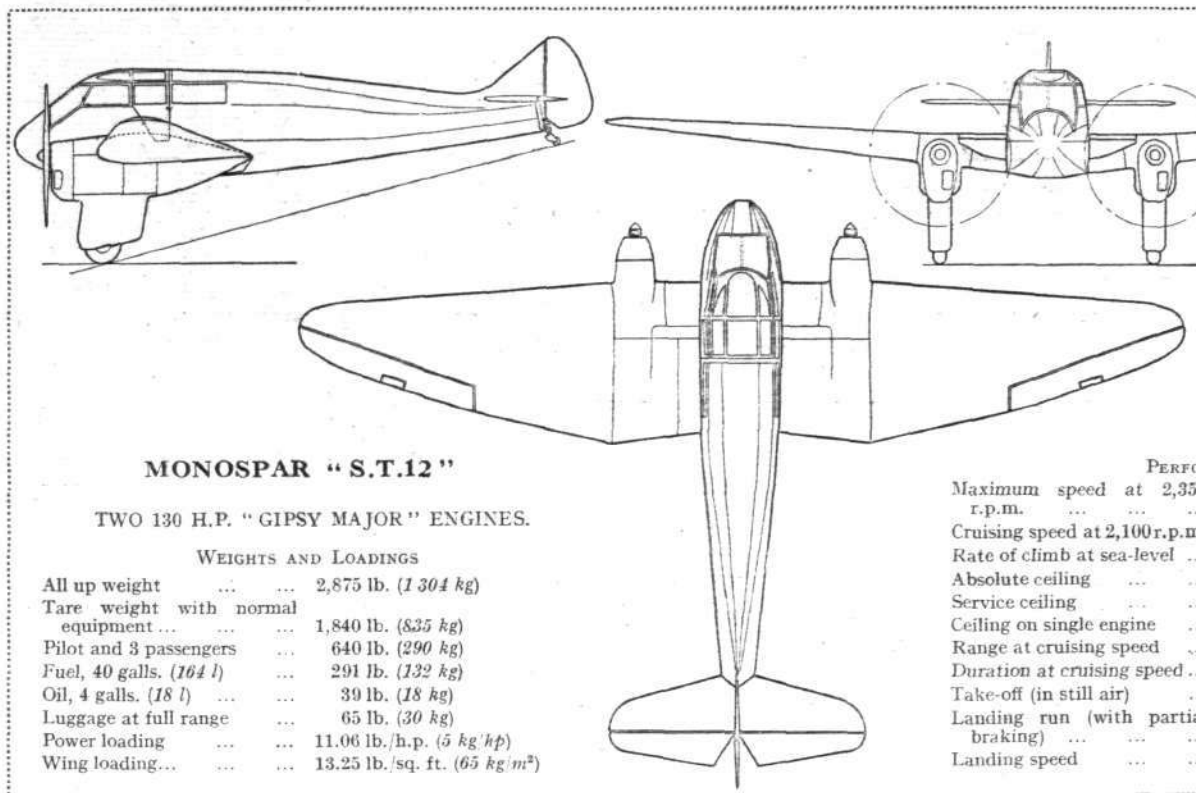
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THE NEW
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MONOSPAR "S.T.12"

TWO 130 H.P. "GIPSY MAJOR" ENGINES.

WEIGHTS AND LOADINGS	
All up weight	2,875 lb. (1 304 kg)
Tare weight with normal equipment	1,840 lb. (835 kg)
Pilot and 3 passengers	640 lb. (290 kg)
Fuel, 40 galls. (161 l)	291 lb. (132 kg)
Oil, 4 galls. (18 l)	39 lb. (18 kg)
Luggage at full range	65 lb. (30 kg)
Power loading	11.06 lb./h.p. (5 kg/hp)
Wing loading	13.25 lb./sq. ft. (65 kg/m ²)

LENGTH.....26'-1"
SPAN.....40'-2"
WING AREA.....150.2 Sq.Ft.

PERFORMANCE	
Maximum speed at 2,350 r.p.m.	158 m.p.h. (254 km/h)
Cruising speed at 2,100 r.p.m.	144 m.p.h. (232 km/h)
Rate of climb at sea-level	1,233 ft./min. (6.3 m/sec.)
Absolute ceiling	21,100ft. (6 439 m)
Service ceiling	19,400ft. (5 913 m)
Ceiling on single engine	4,900ft. (1 493 m)
Range at cruising speed	410 miles (660 km)
Duration at cruising speed	2.85 hours
Take-off (in still air)	85 yd. (78 m)
Landing run (with partial braking)	135 yd. (123 m)
Landing speed	54 m.p.h. (87 km/h)

lar fashion (see description in *Flight* of July 19, 1934). The front windscreen has been modified, and, instead of the flat panes of safety glass previously used, there is now a single large curved sheet of "Rhodoid," a form of celluloid; this should not only give the pilot a better outlook but should obviate both the collection of water and reflection from internal and external lights. Lightly loaded, the "S.T.12" has a climb of 1,800 ft./min., and an amus-

ing story is told of an occasion upon which it outclimbed three R.A.F. single-seater fighters, although it must be admitted that these were of an obsolescent type. The fitting of the "Gipsy Major" engines does not in any way alter the handiness of the wing folding, nor has it resulted in the necessity for changing the interior layout of the cabin. The latest throw-over type of wheel control is used.

Royal Aeronautical Society Lecture

The lecture on "Imperial Air Routes" will be read before the R.Ae.S. on Monday next, January 7, by Mr. F. Snowden Gamble, of Imperial Airways. The lecture will be held in the Lecture Hall of the Institution of Electrical Engineers, Savoy

Place, Victoria Embankment, London, and will commence at 6.30 p.m. It will be of a more popular nature than usual, and the Council hopes that members will bring their friends or grown-up children to this lecture.

A ROTARIAN GATHERING



Seldom before can so many aircraft of an unorthodox type have been seen gathered together at one time. This *Flight* photograph, taken at Hanworth, shows a batch of Autogiros destined for various places in Great Britain, France, Germany and Spain. Another picture appears on page 8.

THE ROYAL AIR FORCE

SERVICE NOTES AND NEWS



AIR MINISTRY ANNOUNCEMENTS

HALF-YEARLY PROMOTIONS

The undermentioned promotions are made with effect from January 1, 1935:—

GENERAL DUTIES BRANCH

Air Marshals to be Air Chief Marshals

His Royal Highness Edward Albert Christian George Andrew Patrick David, Prince of Wales and Duke of Cornwall, K.G., K.T., K.P., G.C.S.I., G.C.M.G., G.C.I.E., G.C.V.O., G.B.E., M.C., Personal A.D.C. to the King.

Sir Robert Brooke-Popham, K.C.B., C.M.G., D.S.O., A.F.C., A.D.C.

Air Vice-Marshal to be Air Marshal

Arthur Murray Longmore, C.B., D.S.O.

Air Commodores to be Air Vice-Marshals

Christopher Lloyd Courtney C.B., C.B.E., D.S.O.
Cuthbert Trelawder Maclean, C.B., D.S.O., M.C.

Group Captains to be Air Commodores

Sydney William Smith, O.B.E.
Charles Frederick Algernon Portal, D.S.O., M.C.

Wing Commanders to be Group Captains

Rey Griffith Parry, D.S.O., Charles Curtis Darley, C.B.E., A.M., George Bentley Dacre, D.S.O., Malcolm Henderson, D.S.O., Lachlan Loudoun Maclean, Keith Rodney Park, M.C., D.F.C.

MOVE OF NO. 142 (BOMBER) SQUADRON

No. 142 (Bomber) Squadron will move from Netheravon to Andover. The move is to be completed by January 17, 1935. The squadron will come under the command of the A.O.C., Western Area, with effect from that date.

NEW FLYING-TRAINING SCHOOL

The new flying-training school which is to be opened as part of the expansion scheme for the instruction of short-service officers will be formed at Netheravon in April, and will be known as No. 6 Flying-Training School.

AIRCRAFT CARRIER'S NEW NAME

It is announced in Fleet Orders that the aircraft carrier *Ark Royal*, Reserve Fleet, The Nore, has been renamed *H.M.S. Pegasus*. This change has been made necessary because the aircraft carrier included in the 1934 Naval Programme has been named *Ark Royal*. The name *Pegasus* was borne by a former aircraft vessel in the Navy.

UNIVERSITY AIR SQUADRONS

The Air Ministry is exercising its power to increase the strength of the Oxford and Cambridge squadrons above the present maximum of seventy-five, and the Treasury has authorised the admission of all new candidates who have decided to apply for permanent commissions in the R.A.F.

Candidates from Oxford and Cambridge who are accepted for permanent commissions in the R.A.F. will in future be sent to Cranwell for final training, instead of to the Flying Training Schools as hitherto. This will give all permanent commission officers a common link with the Royal Air Force College. Naturally, the course for University candidates at Cranwell will not take a full year, as these men will have already done 70 hours flying on training types besides receiving other instruction.

Squadron Leaders to be Wing Commanders

Horace George Bowen, M.B.E., Sturley Philip Simpson, M.C., Geoffrey Hornblower Cock, M.C., Tilden Christmas Thomson, Hugh Leedham, O.B.E., Philip Hildersley Cummings, D.F.C., Robert Stanley Aitken, M.C., A.F.C., Walter Edward George Bryant, M.B.E., Oliver Campbell Bryson, M.C., D.F.C., A.M., Benjamin James Silly, M.C., D.F.C., Percy Eric Maitland, A.F.C., Bernard McEntegart.

Flight Lieutenant to be Squadron Leader

Robert Godmond Poole (Lieutenant Commander, R.N.).

Flying Officers to be Flight Lieutenants

Patrick Arthur Booth (Lieutenant, R.N.), Trevenen Penrose Coode (Lieutenant, R.N.), Nigel Robert Mackie Skene (Lieutenant, R.M.), Dennis Royle Farquharson Cambell (Lieutenant, R.N.), Douglas McIver Russell (Lieutenant, R.N.).

Medical Branch

Wing Commanders to be Group Captains

Harry Aitken Hewat, M.B., Ch.B., D.T.M. & H., Reginald Herbert Knowles, M.D., Ch.B., D.P.H., Andrew Grant, M.B.E., M.B., Ch.B., D.P.H., Thomas James Kelly, M.C., M.D., B.Ch.

Squadron Leaders to be Wing Commanders

Donald George Boddie, M.B., Ch.B., Thomas John Thomas, M.B., B.S., William Fothergill Wilson, M.C., M.B., B.Ch., Duncan McLaren, M.B., Ch.B., Wilfred Ernest Hodgins, M.B., M.C.P. & S., Albert Edward Barr-Sim, M.B., Ch.B., Frederick John Murphy, M.B., B.Ch., Philip Augustus Hall, M.D., M.Ch., Thomas McClurkin, M.B., B.Ch., D.P.H., D.T.M. & H., Dip. Bact.

THE ROYAL AUSTRALIAN AIR FORCE

Reference to Australia's plans for improving her defences by means of additional ships and aeroplanes was made by the Minister for Defence, Mr. Archdale Parkhill, in a debate in the House of Representatives on the defence estimates which, according to *Reuter*, amount to £5,600,000. The Government's proposals include the starting in Australia of naval construction and the continuation of anti-aircraft defence mechanisation designed to improve coastal defence by means of additional aircraft.

THE ROYAL AIR FORCE BENEVOLENT FUND

The Council of the Royal Air Force Benevolent Fund at their recent meeting received with much regret the resignation of Sir Charles McLeod, who had been the treasurer of the Fund since its inception in 1919, and in addition Chairman of the Council during the last six years. His work has been of the greatest value to the Fund, which has become well established under his guidance, and by the end of 1933 had expended over £150,000 on relief alone. The Council is now much to be congratulated on the fact that Lord Wakefield has accepted the Chairmanship. The Council were informed that grants to the amount of £1,641 6s. 9d. had been disbursed since the last meeting on October 3, 1934. The number of applications dealt with during this period amounted to 334. The next meeting of the Council will be held on March 30, 1935.

The Grants Committee

The usual meeting of the Grants Committee was held on Tuesday, December 18. Mr. W. S. Field was in the chair, and the other members of the committee present were Mrs. L. M. K. Pratt Barlow, O.B.E., and Wing Com. H. P. Lale, D.S.O., D.F.C. The committee considered a number of cases and made grants to the amount of £505 1s. The next meeting was fixed for Tuesday, January 8.

HALTON INSPECTION

The passing-out inspection of aircraft apprentices was carried out on December 18 by AVM. F. W. Bowhill at Halton. The following awards were announced:—

Cadetships at Cranwell College:—Corpl. Apprentice C. D. Milne, Sgt. Apprentice L. F. Cooper, Sgt. Apprentice J. G. Fraser.
Lord Wakefield Scholarship.—Sgt. Apprentice L. F. Cooper.
Elliott Memorial Prize.—L/A/App. William Potts.

DONIBRISTLE AERODROME—NOTICE OF DRAINAGE OPERATIONS

Drainage operations will be in progress on parts of Donibristle aerodrome during the next few months. Pilots are advised to ascertain, before they land, the actual extent of the area available for landing. Bad ground will be marked by the standard markings.

ROYAL AIR FORCE GAZETTE

London Gazette, December 25, 1934

General Duties Branch

F/O. R. W. P. Collings is promoted to the rank of Flight Lieutenant (Aug. 1); P/O. G. L. S. Griffith-Jones is promoted to the rank of Flying Officer, with effect from April 7, and with seny. of Oct. 7, 1933.

The following Pilot Officers are promoted to the rank of Flying Officer:—R. E. G. Brittain, F. A. Paynter, P. B. Wood (Sept. 17); E. M. Lewis, J. H. Hill (Nov. 1).

The following cease to be attached to the R.A.F. on return to Naval duty:—Lt. Com. D. G. F. W. Macintyre, R.N., Flying Officer, R.A.F. (Nov. 27); Lt. N. Kennedy, R.N., Flight Lieutenant, R.A.F. (Dec. 7); Lt. N. S. Luard, R.N., Flight Lieutenant, R.A.F. (Dec. 15).

Sqd. Ldr. R. F. S. Leslie, D.S.C., D.F.C., A.F.C., is placed on the retired list (Dec. 25); F/O. G. L. C. Jenkins relinquishes his short service commission on account of ill-health (Dec. 24); Lt. (now Lt. Com.) G. M. Pares, R.N., Flying Officer, R.A.F., relinquishes his temporary commission on return to Naval duty (Jan. 10, 1933). (Substituted for notification in the *Gazette* of Jan. 17, 1933.)

Accountant Branch

The following Flying Officers are promoted to the rank of Flight Lieutenant (Dec. 3):—R. D. Pratt, L. Chegwidan, G. H. White, R. L. M. Hall, V. H. Lewis.

Medical Branch

F/O. J. A. Crockett, M.B., B.Ch., resigns his short service commission (Dec. 1).

Chaplains Branch

A. S. Giles is granted a short service commission with the relative rank of Squadron Leader, with effect from and with seny. of Dec. 11.

PRINCESS MARY'S ROYAL AIR FORCE NURSING SERVICE

Sister Miss G. Sawnstun is placed on the retired list on account of ill-health (Dec. 24).

R.A.F. STAFF COLLEGE

The R.A.F. Staff College qualifying examination for all candidates from Home commands will be held at the R.A.F. Depot, Uxbridge, from Tuesday, January 22, to Thursday, January 24, 1935, inclusive.

BIGGIN HILL AERODROME—OBSTRUCTIONS

Turfing operations, now in progress at Biggin Hill aerodrome between the landing circle and the N.W. corner of the aerodrome, will last for approximately six months. Bad ground will be indicated by standard markings. Pilots are to exercise care in landing.

RESTRICTED USE OF R.A.F. STATIONS DURING LEAVE PERIODS

The R.A.F. Station, Catterick, has been closed from December 15, 1934, to January 15, 1935, during which period No. 26 (A.C.) Squadron will be on leave. Between these dates, aircraft should land only in cases of emergency.

ROYAL AIR FORCE RESERVE

Reserve of Air Force Officers

General Duties Branch

The following Flying Officers relinquish their commissions on completion of service:—D. J. L. Bryden (July 16); W. G. Gunning (Dec. 7).

F/O. P. Christopherson relinquishes his commission on completion of service and is permitted to retain his rank (Dec. 20).

AUXILIARY AIR FORCE*General Duties Branch*

No. 602 (CITY OF GLASGOW) (BOMBER) SQUADRON.—F/O. D. W. Law resigns his commission (Nov. 6).

No. 603 (CITY OF EDINBURGH) (BOMBER) SQUADRON.—F/O. A. Wallace relinquishes his commission on completion of service (Sept. 11).

No. 608 (NORTH RIDING) (BOMBER) SQUADRON.—Sqd. Ldr. I. W. H. Thomson resigns his commission on relinquishing command of the Squadron (Dec. 1); Flt. Lt. G. H. Ambler is promoted to the rank of Squadron Leader and appointed to command of the Squadron (Dec. 1).

AUXILIARY AIR FORCE RESERVE OF OFFICERS*General Duties Branch*

D. W. Law is granted a commission as Flying Officer in class C (Nov. 6).

December 21, 1934

TERRITORIAL ARMY**ROYAL ENGINEERS.***Anti-Aircraft Searchlight Battalions*

27TH (LOND.) A.A.S. BN. (L.E.E.).—Sgt. W. B. Rowntree to be Sec. Lt. (Dec. 22).

Anti-Aircraft Searchlight Companies

SURREY GROUP.—Sec. Lt. L. O. Woodward to be Lieutenant (Dec. 20).



A RE-UNION DINNER of old members of No. 1 Squadron, R.F.C., was held recently, and this photograph shows some of those present. Giving the ranks held in the war, at the head of the table is Flt. Sgt. Humphreys, and on his left hand in order are A/M's Withers, Tudgey, Evans, Cpl. Dupe, A/M's Lee, Smith, Coleshill, French, Warner, Oleefe, and Stitson. On the right hand of the chairman are A/M's Harding, Saunders, Miller, Crease, Heywood, Copplestone, Vernon, Russel and Leech.

ROYAL AIR FORCE INTELLIGENCE

Appointments.—The following appointments in the Royal Air Force are notified:—

General Duties Branch

Group Captain.—T. L. Leigh-Mallory, D.S.O., to No. 2 Flying Training School, Digby, 19.12.34; to Command.

Wing Commanders.—A. W. F. Glenny, M.C., D.F.C., to No. 22 Group Headquarters, S. Farnborough, 15.12.34; for Air Staff duties vice Wing Com. A. J. Capel, D.S.O., D.F.C. T. Q. Studd, D.F.C., to Station Headquarters, North Weald, 14.12.34; to Command vice Wing Com. G. B. A. Baker, M.C.

Squadron Leaders.—O. R. Gayford, D.F.C., A.F.C., to No. 58 (B) Squadron, Worthy Down, 15.12.34; for flying duties vice Sqd. Ldr. A. L. A. Perry-Keene. G. H. Cock, M.C., to No. 9 (B) Squadron, Boscombe Down, 20.12.34; to Command vice Wing Com. A. W. Mylne. W. J. Seward, to Headquarters, Coastal Area, Lee-on-the-Solent, 18.12.34; for Personnel Staff duties vice Sqd. Ldr. C. F. Horsley, M.C.

Flight Lieutenants.—J. Marsden, to D. of T., Dept. of Air Member for Personnel, Air Ministry, 17.12.34. M. D. Ommanney, to Station Headquarters, Tangmere, 17.12.34. J. A. T. Ryde, to Experimental Section, Royal Aircraft Establishment, S. Farnborough, 11.12.34. T. J. E. Thornton, to Reception Depot, West Drayton, 17.12.34. H. M. S. Wright, to No. 27 (B) Squadron, Kohat, India, 18.11.34. R. B. Jordan, to No. 1 School of Technical Training, Halton, 14.12.34.

Flying Officers.—J. A. B. Begg, to Aircraft Park, India, Lahore, 13.12.34. L. R. S. Freestone, to Air Armament School, Eastchurch, 16.12.34. R. J. R. H. Makgill, to Home Aircraft Depot, Henlow, 1.10.34. J. G. Mansfield, to No. 24 (Communications) Squadron, 16.12.34. R. H. Page, to Home Aircraft Depot, Henlow, 1.10.34. L. E. B. Stonhill, to Air Armament School, Eastchurch, 22.10.34. T. C. Chambers, to School of Naval Co-operation, Lee-on-the-Solent, 17.12.34. L. M. Hooper, to Air Armament School, Eastchurch, 9.12.34. A. Franklin, to School of Naval Co-operation, Lee-on-the-Solent, 18.12.34.

Pilot Officers.—F. J. Manning, to No. 1 Armament Training Camp, Bridlington, 17.12.34. F. D. Terdrey, to School of Naval Co-operation, Lee-on-the-Solent, 13.12.34. W. B. Fleming, to Anti-Aircraft Co-operation Flight, Biggin Hill, 10.12.34. A. F. Hamilton, to No. 12 (B) Squadron, Andover, 8.12.34.

Acting Pilot Officers.—C. C. Hodder, to No. 27 (B) Squadron, Kohat, India, 7.11.34.

Chaplains Branch

Rev. A. S. Giles, to Headquarters, R.A.F., Cranwell, 11.12.34. For duty as Chaplain (C. of E.), on appointment to a Short Service Commission.

Stores Branch

Flying Officer.—R. B. Fleming, to R.A.F. Base, Gosport, 20.12.34.

A NEW INTERNATIONAL RECORD

Raymond Delmotte's 314.3 m.p.h. with a Landplane—the Racing Caudron with new 370 h.p. Renault Engine

ON Christmas Day M. Raymond Delmotte, chief pilot of the Caudron Co., established a new international speed record at Istres Aerodrome, when, flying a low-wing Caudron monoplane equipped with a new 370 h.p. Renault six-cylinder-in-line air-cooled supercharged engine, he flew over the regulation course at an average speed of 505.84 km./hr. (314.3 m.p.h.).

He thus eclipsed the previous record of 490.8 km./hr. (305 m.p.h.) made last year by the American pilot, the late James Weddell, who flew a Weddell-Williams monoplane equipped with an 800 h.p. Pratt and Whitney supercharged "Wasp" air-cooled radial engine.

The attempt consisted of four trial flights over a regulation three-kilometre straight course, the average time made during all of them being taken as the final result. Delmotte made a preliminary attempt in the morning, but, owing to a cross-wind of 10 m.p.h. then prevailing, he was able to attain only 478 km./hr. as the average result. He then waited until the afternoon, when, the wind having fallen to about 2½ m.p.h., he took off again and accomplished an average speed of

505.84 km./hr., according to the official timers, who will submit this figure to the F.A.I. for homologation.

The Caudron monoplane used is similar to the type which competed in the Deutsch Cup Race this year and has been described in *Flight*. The only departure is the use of the new Renault engine of 9½ litres cylinder displacement instead of one of 8 litres as required by the rules of the Deutsch Cup Contest. The machine used for the record attempt was also equipped with a Messier retractable undercarriage, which functioned perfectly; the Caudrons flew in the 1934 Deutsch Cup Race with fixed landing gears. Since the race, several records have been established by these machines.

The principal characteristics of the new Renault engine are as follows: Bore and stroke, 120 × 140 mm.; cylinder displacement, 9½ litres (579.8 cu. ins.); power, 370 h.p. at 3,250 r.p.m. The engine was equipped with a Renault centrifugal-type supercharger, which runs at 26,000 r.p.m., and a Ratier variable-pitch propeller automatically adjustable in flight

R. C. W.

SCOTT AND BLACK AMONG THE GOLFERS

THE first annual dinner of the Heston Golfing Society, which was formed some little time ago, was held recently at Sudbrook Park, Petersham, which is the club house of the Richmond Golf Club, to which the Heston G.S. is affiliated. Mr. A. J. A. Wallace Barr, of Cellon fame, was in the chair, and the vice-chairman was Mr. B. S. Allen, the Society's captain.

The guests of the evening were Messrs. C. W. A. Scott and T. Campbell Black, and amongst those present were the Hon. Brian Lewis, Com. H. E. Perrin, Maj. R. A. F. Montanaro (Commanding Officer at Kingston Barracks), and Mr. A. Percy Bradley (Clerk of the Course at Brooklands).

An Apt Parallel

In proposing the toast of "The Visitors," the Chairman said that he was sorry that Mr. Scott and Mr. Black had made the England-to-Australia Golf Course look silly. It had originally its full complement of eighteen holes, and these two had now reduced it to a course with six holes only, each of which they had done in one. Mr. Scott, replying, said that he was confident that the record which they had set up would in due course be beaten—they had set it up by a well-drilled foursome team, using the best obtainable "club."

Mr. Black said that on the flight Mr. Scott had beaten him in the speed record by eighteen inches, because he had occupied the back seat; and, so far as oratory was concerned, he

would give Mr. Scott the front seat again. So once again Mr. Scott spoke, this time for over an hour, and so well did he do it that those present were left in doubt as to which was his greater accomplishment—flying or oratory.

The cheery evening over, the visitors left to grope their way homeward through the thick fog prevailing at the time.

NEXT WEEK'S ISSUE

of

FLIGHT

will include a review of notable events in the world of aviation during the past year. A summary of technical progress will also be a feature of next Thursday's issue.

Captain HUBERT BROAD

TESTS — and testifies to

GIPSY ENGINES



ALL LETTERS SHOULD BE ADDRESSED TO THE COMPANY AND NOT TO INDIVIDUALS

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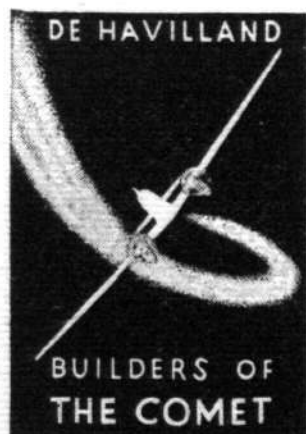
December 31st, 1934.

I have been Chief Test Pilot
for The de Havilland Aircraft Co., Ltd.
since October 1921.

I have sat behind upwards of
two thousand Gipsy engines, have flown
many hundred of hours on full throttle
tests and development trials, have taken
part in numerous International contests,
and have competed in no less than seven
King's Cup Races on de Havilland aeroplanes
fitted with Gipsy engines.

I have NEVER HAD A FORCED LANDING
THROUGH FAILURE OF A GIPSY ENGINE.

Hubert S. Broad

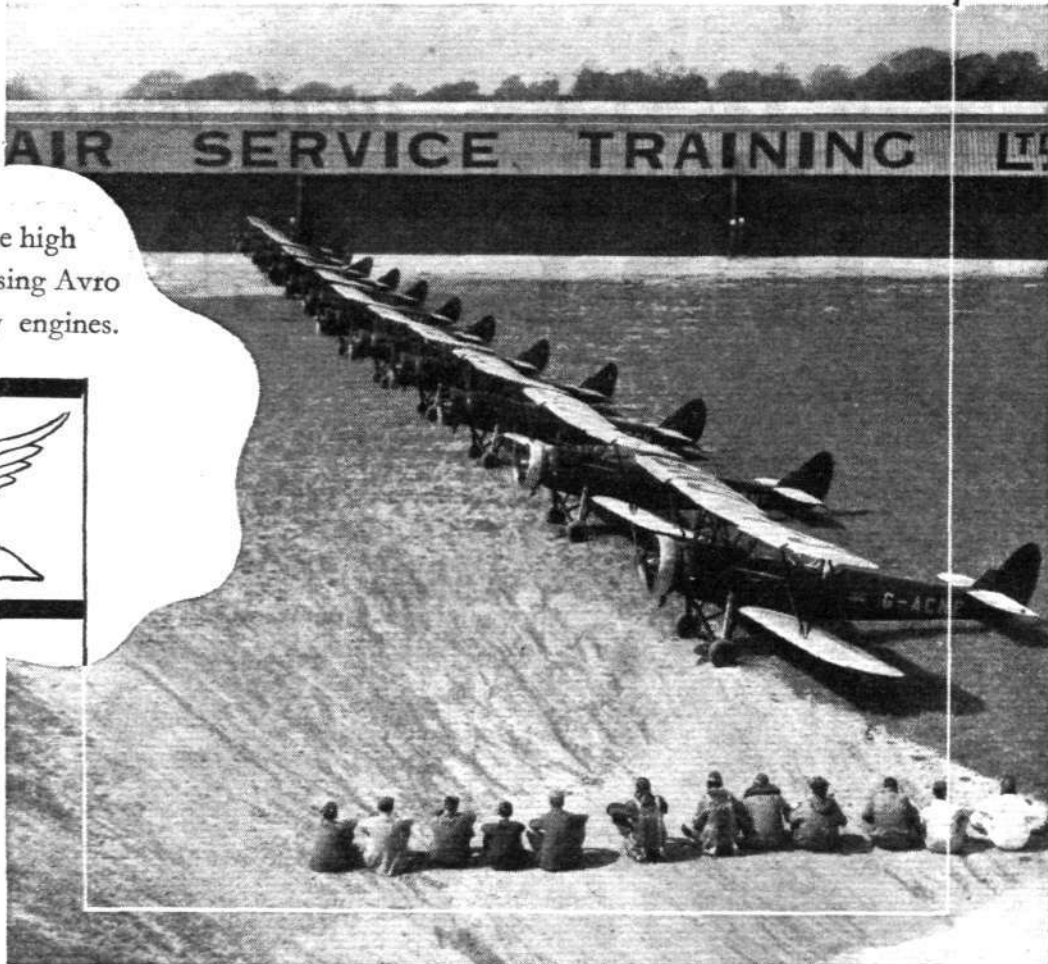


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MORE TRAINING AIRCRAFT ★

The machines illustrated include a new delivery of "Cadets" to the famous "Air University" of Air Service Training Ltd.

This school, which is the only one of its kind in the world, maintains the high standard of its flying instruction by using Avro aeroplanes equipped with Siddeley engines.



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Photo by courtesy of 'Flight'

THE A.W. SCIMITAR

ALL METAL SINGLE SEATER FIGHTER

SIR W. G. ARMSTRONG WHITWORTH AIRCRAFT LTD., WHITLEY, COVENTRY.

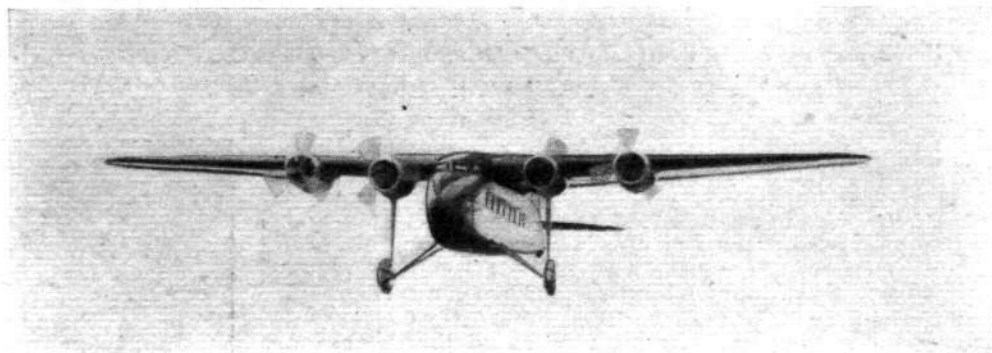
A FAST ITALIAN MONOPLANE

New Savoia Marchetti:

Twenty-seven Passengers

Carried at a Cruising

Speed of 174 m.p.h.



FLYING boats constructed by the Savoia Marchetti concern are well established in commercial operation, and their general features are known to readers of *Flight*. The company has, however, pursued of late a policy providing for the development of fast land machines of high- and low-wing monoplane types.

Largest of the new Savoia series is the S.74 high-wing commercial monoplane, now under construction. In this machine, which uses a similar wing section to that employed on the S.55 flying boat and S.64 land plane which have established duration and distance records, the wing structure is of wood, and comprises three main spars, the whole wing being covered with plywood. Protective varnish is applied to the interior and the whole wing is given a covering of fabric. Four engine nacelles are carried below the wing, the inner pair being reinforced to support the compression legs of the undercarriage.

Welded steel tubular construction is employed for the fuselage, in the nose of which is the pilots' cockpit fitted with dual controls. The passenger cabin is 7ft. 6in. wide and 6ft. 6in. high, and may be fitted with two alternative seating arrangements, one for twenty armchairs, with adjustable seats and backs, and the other for twenty-seven ordinary aircraft chairs. Large sliding windows on each side of the cabin serve as emergency exits. A bar and a lavatory are provided. Beneath the passenger cabin is a large luggage compartment with room for mail and freight.

A split-type undercarriage is employed, the wheels being fitted with differentially controlled hydraulic brakes connected to the rudder bar, and enclosed in streamline fairings. The tail wheel is of the swivelling type. Welded steel tubes form the members of the *empennage*, and this is fabric covered. Tail plane incidence is adjustable in flight and the fin may be adjusted on the ground. Four 700 h.p. Piaggio "Stella IX" engines, driving three-bladed Savoia Marchetti metal variable pitch airscrews, are mounted on welded steel tube bearers fixed to the

lower surface of the wing. The fuel tanks, which form fairings behind the engines, may be dropped during flight. An air compressor is installed in the pilots' cockpit for starting the engines.

SAVOIA MARCHETTI S.74.

FOUR 700 H.P. PIAGGIO "STELLA IX's"

DIMENSIONS

Span	...	89ft. 5in. (30 m)
Length	...	64ft. (19.5 m)
Height	...	18ft. (5.5 m)
Wing Area	...	1,291 sq. ft. (120 m ²)

WEIGHTS AND LOADINGS

Weight empty	...	17,200 lb. (7 800 kg)
Normal disposable load	...	11,907 lb. (5 400 kg)
Maximum permissible disposable load	...	13,671 lb. (6 200 kg)
Normal gross weight	...	29,106 lb. (13 200 kg)
Maximum permissible gross weight	...	30,870 lb. (14 000 kg)
Wing loading	...	22.55 lb./sq. ft. (110 kg/m ²)
Power loading	...	10.41 lb./h.p. (4.64 kg/hp)

PERFORMANCE ON FOUR ENGINES

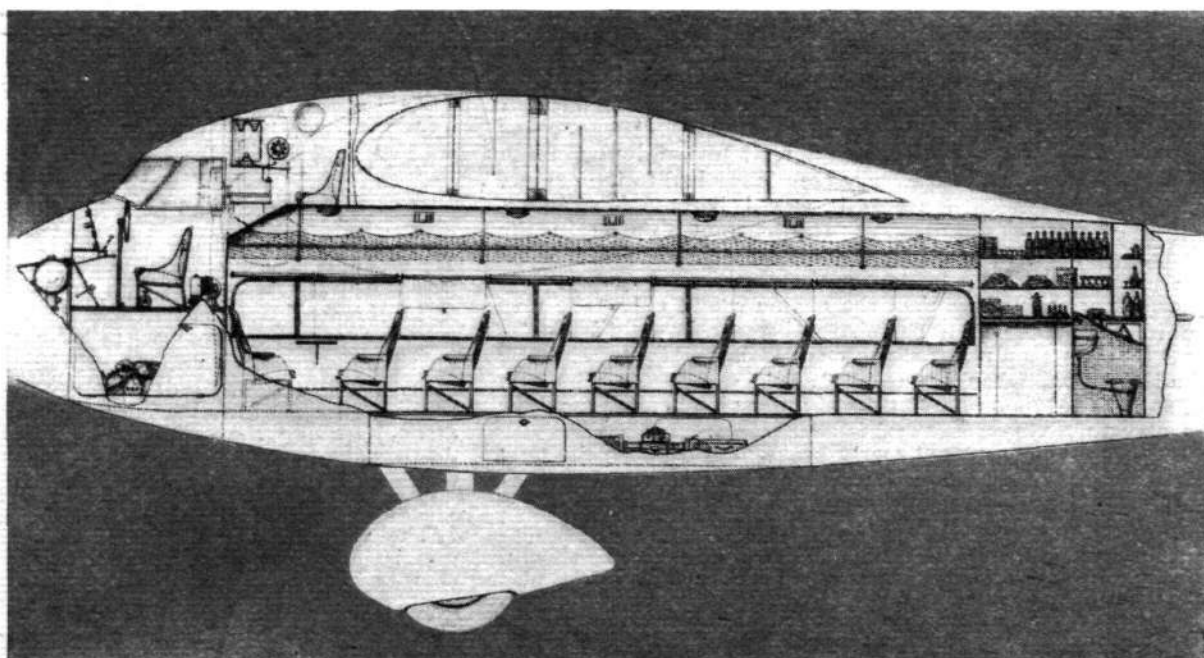
Maximum speed at 3,280ft. (1 000 m) at 2,330 r.p.m.	...	199 m.p.h. (320 km/h)
Cruising speed at 3,280ft. (1 000 m) at 2,050 r.p.m.	...	174 m.p.h. (280 km/h)
Climb to 3,280ft. (1 000 m)	...	3 min. 30 sec.
Climb to 6,560ft. (2 000 m)	...	7 min. 30 sec.
Climb to 9,840ft. (3 000 m)	...	12 min. 20 sec.
Climb to 13,120ft. (4 000 m)	...	19 min.
Climb to 16,400ft. (5 000 m)	...	30 min.
Service ceiling	...	19,680ft. (6 000 m)

PERFORMANCE ON THREE ENGINES

Service ceiling	...	9,840ft. (3 000 m)
Maximum speed	...	162 m.p.h. (260 km/h)

PERFORMANCE ON TWO ENGINES

Service ceiling	...	3,280ft. (1 000 m)
Maximum speed	...	124 m.p.h. (200 km/h)



A sectional view of the S.74's cabin. Note how the luggage is carried beneath the floor.

Correspondence

The Editor does not hold himself responsible for opinions expressed by correspondents. The names and addresses of the writers, not necessarily for publication, must in all cases accompany letters intended for insertion in these columns.

"NUTS TO CRACK"

[2988] May I suggest as a solution to Flt. Lt. Comper's first "teaser" that the relative angular position of the prop. on its hub considered in relation to the valve timing diagram and the position of the exhaust pipe ends was to blame?

In high-performance engines with individual exhaust pipes, under certain conditions of b.h.p. and r.p.m., the length of the pipes and the air pressure and flow around the ends would allow of air rushing back up the pipe to fill the depression left after the ejection of an almost solid column of exhaust gas at high velocity. This would serve to spoil the inlet mixture and, in an engine with considerable timing overlap, might even cause a direct reversal of flow through the carburettor choke.

This could be cured by altering the angular position of the prop. on its hub, or by altering the length or the position of the exhaust pipe ends.

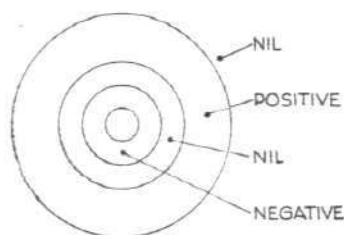
I await with interest Mr. Comper's solution.

London, W.2.

ROBT. CECIL CLERK.

[2989] There are several ways of cracking nuts, some methods applying only to certain cases; below I set forth one method of approaching this seasonable edible.

A racing airscrew and a general-purpose airscrew will have certain characteristics common to each. The slipstream velocity of both will be:—



Aircraft velocity (this is less, due to poor efficiency on climb in the case of racing propeller) + Air flowing behind airscrew (the difference in velocity aft of airscrew is balanced by aircraft velocity).

∴ Inflowing air = Outflowing air (when inflowing velocity is near to airscrew).

Now, the slipstream at the airscrew disc is approximately as shown in the accompanying sketch. The airflow starts at negative, flows to nil and then to positive, and so on. The vortices set up in the case of the racing propeller caused a lack of air at the air intake, giving the engine too rich a mixture. The airscrew speed would then drop and the vortices miss the air intake, hence the surge of air and the "phit—bang—phut" described in the article.

The reason that the engine fired properly on the ground was that there was no aircraft velocity, thus the intensity of the outflowing air was less, and the vortices missed the air intake.

This may not be the solution, but in all probability it is an explanation of some engine periods.

Westcliff-on-Sea, Essex.

J. GODFREY MATHIESEN.

[2990] I suggest that the "Nuts to Crack" trouble was caused by the metal prop. generating an electrical charge by friction with the air. As long as the machine was in contact with the ground this charge would leak away, but as soon as it was in the air the charge would tend to build up. Since one end of the primary of the magneto is earthed to the engine, the potential difference across it would become less and a weaker current would flow. The current flowing in the secondary would, of course, become proportionately less, until such time as it would be too weak to jump the plug points under compression, and then the engine would cut. The revs would fall and the frictional charge become less until a sufficient balance was restored to enable the H.T. to fire the cylinders again, when the engine would once more pick up; and so it would go on cutting and firing as long as the machine was able to fly.

The fact that the pilot "nearly broke his neck" in the final try-out might be explained by reason of his having just previously been round the course flat out with his wooden prop. The engine would thus be hotter and freer than usual, and would, therefore, rev up quicker and die down more slowly, thus giving a shorter burst of power and a longer "dead" period. May I take this opportunity of wishing *Flight* every success in the New Year?

R. J. HARMER.

Southbourne, Hants.



HOMEWARD BOUND: Mr. D. S. Wylie, secretary of Eastern Air Transport of Sydney, and Mr. D. F. Collins (chief pilot), who, after a stay in this country, are returning by easy stages in a Monospar "S.T.11" (two Pobjoy "Niagaras"). Eastern Air Transport are planning a line between Sydney and Canberra, while the Monospar will be used for special charter work. Wing Com. W. J. Wackett, who recently designed the "Codock" (two Napier "Javelins") for Sir Charles Kingsford Smith, has joined the company as aircraft designer.

[Several readers, in the foregoing letters, have practically hit upon the solution. Flt. Lt. Comper gives the answer as follows:—

"The wooden airscrew was set on the boss at one angle relative to the firing stroke. The metal airscrew was at a slightly different angle and one of its blades swept the air intake opening—which faced forward—at an awkward moment for the carburettor. Hence the violent misfiring. After the metal airscrew had been remounted at a different angle the trouble disappeared completely."

Flt. Lt. Comper will provide another "nut to crack" in an early issue.—ED.]

GREETINGS BY AIR FROM MISS BATTEN IN AUSTRALIA

[2991] As the air service between Australia and England is to be inaugurated on December 10, when the first mail leaves Brisbane for London, this letter will arrive before Christmas.

I am taking this opportunity of sending Christmas and New Year greetings to you and all readers of *Flight*.

JEAN BATTEN.

AN ITALIAN ACHIEVEMENT

[2992] I read, on page 1327 in your issue of December 13, the words. "The coast south of Rome is flat and uninteresting, and when we reached the Gulf of Gaeta we cut straight across it to Naples."

The Pontine marshes used to be in the coast south of Rome, up to the Gulf of Gaeta. The Roman Empire and the Popes unsuccessfully tried to dry them. Now Fascism have taken the work in hand, and is carrying on what doubtlessly is one of the most ambitious programmes ever put up by any Government, any time, anywhere. Hundreds of thousands of workmen with modern machinery are building new towns and villages—Littoria, Sabaudia, Pontinia.

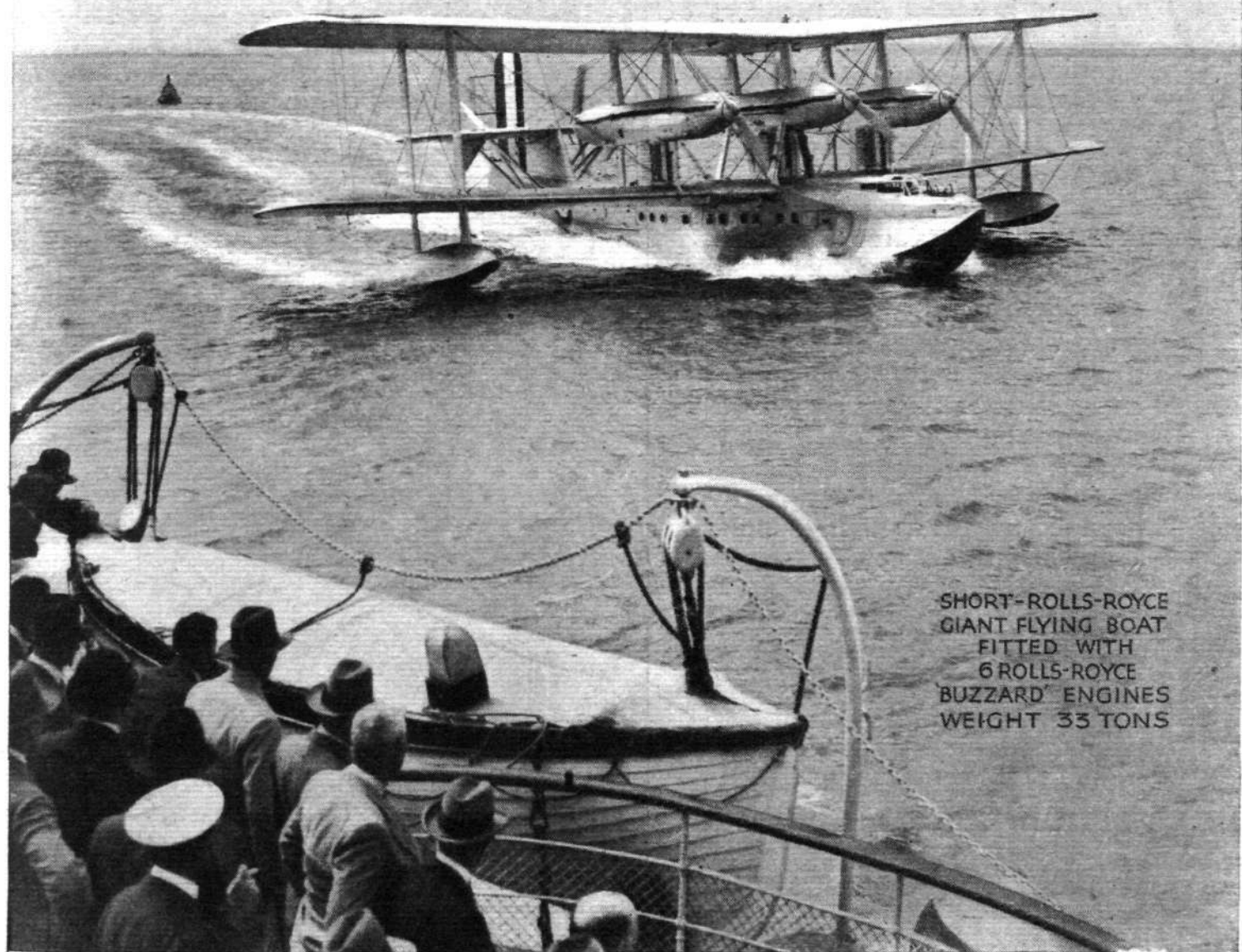
The view from the air is impressing, colossal and truly fascinating. Any pilot flying from Rome to Naples would be well advised to fly fairly low from Anzio to Mount Circeo to enjoy one of the most interesting and exciting spectacles of the modern world.

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P.A.42A

PRIVATE FLYING

LORD SEMPILL, A.F.C., F.R.Ae.S., CONTINUING THE STORY OF HIS WORLD FLIGHT, DESCRIBES AERONAUTICAL CONDITIONS IN THE INDIAN PROVINCES

KARACHI, the gateway of India as far as flying is concerned, has a large and well-organised aerodrome. For several years a terminus, rather than a gateway, for the British-India Imperial Airway, Karachi will become increasingly important with the completion of the Australian route. It is already fairly well equipped with good sheds and night landing lights, but as a good deal of money has been made available by the Indian Government for its further development, considerable improvement in its layout and facilities is to be expected in the near future.

For those who, like myself, have long been interested in the future of lighter-than-air craft, it is sad to see the mooring-mast, erected as one link of an Empire chain of bases for airships, not being utilised. The mast, together with the airship hangar which is used by Imperial Airways, is, however, kept in fine order, and both will, it is hoped, eventually serve the purpose for which they were built.

While at Karachi I stayed with Commander Watt, one of our few remaining airship officers, who is in charge of the airport, having been there for the last four years. He is an excellent organiser, and, indeed, I found all the officials most obliging and anxious to help. Mr. and Mrs. Mollison were there when I arrived, everyone deploring their bad luck after having put up such a wonderful performance on the first lap of the Melbourne Race. I found that tremendous interest had been aroused by the Race.

Maintenance Problem

THERE is so much of interest at the various stops, and so many people to see, that it is difficult to find time to give one's machine the attention that it needs. Under such conditions one wishes for a really well-trained man who could, for example, look after the cleaning and refuelling. One cannot always rely on getting the machine properly washed; at one stop the fine finish was entirely spoilt by a mechanic using a vile fish soap. Incidentally, the necessity, on such a flight as this, for frequent changing of the elements on the oil filter has decided me to fit one of the Auto-Klean type when I do the next routine overhaul.

After leaving Karachi, my next stage took me to Jodhpur, which was reached after six hours' flying. A good deal of the country appeared very barren, but I passed a number of landing grounds laid out by H.H. the Maharajah of Jodhpur. There is a great future for aviation in India, and if more of the native princes followed the Maharajah's example progress would be very rapid. Apart from the main aerodrome at Jodhpur, His Highness has laid out some fifteen landing grounds throughout the State, all of which are level and not less than 500 yards square, each having a wind sock and a man in attendance. I suggested that they should be marked with an air sign indicating the name, and gathered that this suggestion will be carried out in due course.

The Maharajah did me the honour of inviting me to be his guest during my stay, and I was greatly impressed by his technical knowledge of all aviation matters as well as his great keenness. He is an excellent pilot. I saw him take off and land in his Monospar with full load, and the machine could not have been better handled. His High-

Enthusiasm In India

ness has two Monospars and a Comper "Swift," as well as two "Gipsy Moths," which are generally on loan to the Flying Club. I understood he intended to add to his "stable" by fresh purchases of British aircraft, and that he was much impressed by the performance of the latest De Havilland machines.

It was a real pleasure to visit this model state, which is administered by British ministers in the employ of the Maharajah. The city, viewed from the air, is very imposing, with good buildings well laid out. The aerodrome at Jodhpur is very fine, with a well-built station building, and a hangar large enough to accommodate any commercial machine which might want to put up for the night.

Civil Development

THE layout of the aerodrome and sheds, which are well designed and maintained, has been arranged by the minister responsible for engineering services, who has had the advantage of technical advice by Mr. Muntz and Mr. Nigel Norman. I had a most interesting talk with Mr. S. G. Edgar, the Minister for Public Works, who was very anxious to learn the latest British practice. Excellent night-landing equipment has been installed, and the beacon can be seen from a distance of fifty miles.

Aviation in India, under the direction of the D.C.A., Captain Tymms, is making good progress generally, and there is considerable development in private flying. The Aero Club of India and Burma, which is affiliated to the F.A.I., is the co-ordinating body, and acts as an intermediary between the Government and the flying clubs.

Prior to 1934 the clubs received a fixed bonus as well as a payment of Rs.100 for each *ab initio* pilot trained and licensed. In the grant for 1934-35 a fixed payment of Rs.17,000 only to each club was arranged for. In 1933 the total membership amounted to 1,750, the hours flown being 11,000—a considerable increase over the previous year. Of the 68 *ab initio* pilots trained during the year, 39 were Indian and 29 European. At the end of 1933 there were 82 civil aircraft, 37 being in the private category. On the same date there were in India 216 private pilots, 43 commercial and eight "limited commercial" pilots. Registered ground engineers numbered 23.

The cost of club flying tends to decrease, although the balance for 1933 was on the wrong side. From an analysis of the accounts of the subsidised clubs for that year, it would appear that while the receipts per flying hour, including the subsidy, amounted to Rs.52, the cost approximated to Rs.55. As a result of a series of conferences arranged by the Aero Club of India to discuss this problem, a marked improvement is expected.

Club's Mail Service

THE good work of the Delhi Flying Club in running the air mail service between Karachi and Delhi for a period of eighteen months prior to the inauguration of the Karachi-Calcutta Section of the Australian route deserves special mention. The average load of mail carried in the "Gipsy Moth" used on this service amounted to 101lb. per trip, and on only two occasions did the machine fail to connect with the westward-bound Imperial Airways air liner at Karachi.

Their Excellencies the Viceroy and the Countess of Wiltshire, by their frequent use of air transport for official tours, show a great example in thus encouraging aviation, which is proving a valuable aid to their work in India.

Private Flying

FROM THE CLUBS

Events and Activity at the Clubs and Schools

LIVERPOOL

A total of 62 hr. 5 min. flying was carried out at Hooton and Speke by the Liverpool and District Aero Club during the last fortnight of the old year in spite of very unsettled weather.

HATFIELD

At the London Aeroplane Club the flying time for the week ended December 21 was 37 hr. 25 min. New members were Mr. T. K. Breakell and Dr. and Mrs. MacLean. Mr. E. F. C. Burchell carried out his "A" tests.

Owing to the increased demand for blind flying training, another "Tiger Moth" is being equipped with a hood and instruments for instruction.

The flying during the same period at the Royal Air Force Flying Club was four hours. Lt. J. F. Marmont and P/O. C. R. Paylor have been enrolled as new members.

HANWORTH

During the last fortnight "A" licence tests were passed successfully by J. Sear and P. H. Bristow.

Mr. Wood, pilot to Mr. Anson, left Hanworth in Mr. Anson's D.H. "Rapide" to pick up his party at Manston and proceeded to Zurich for Christmas.

Mr. Noel, chief pilot to the Guernsey Aero Club, took delivery of their "Avian," supplied by the Aircraft Exchange and Mart, Ltd., and proceeded to the Channel Islands, taking with him numerous gifts for friends and relations.

A B.2 and an Avro "Cadet" have been fitted for blind flying, and many "B" licence members are taking the opportunity of receiving instruction prior to taking the tests at Hendon.

Flying hours over the Christmas greatly exceeded those of last year, and although the weather was very dull, the club machines, as well as a number of privately owned machines, were kept busy for best part of the time.

NEWCASTLE-UPON-TYNE

During the past year 1,292 hours of flying were carried out. This total compares very favourably with that carried out in 1933, when the total was 1,328 hours. Our total for this year would have been increased considerably if the weather conditions had been favourable during the past ten weeks.

Twelve members qualified for their "A" licences, and one member, Mr. L. Dey, obtained a "B" licence. Six further members are waiting for suitable weather to complete their "A" tests.

The club has recently taken delivery of a "Gipsy I Moth" similar to those at present in use at Cramlington, this additional machine bringing the equipment up to four. One is fitted for blind flying, and a considerable amount of such instruction has been carried out since the machine was equipped in October.

The annual dinner-dance is being held at Tilley's Barras Bridge Assembly Rooms, Newcastle-upon-Tyne, on January 29.

CAMBRIDGE

Flying times at Fen Ditton for the fortnight ended December 28 totalled 35 hr. 30 min. dual and 13 hr. solo. On several occasions visibility was so bad that the instructors had to arrange circuits in rotation to avoid any possibility of more than one machine being in the air at a time, and the Christmas holidays, of course, were partly responsible for the drop.

Mr. Panes carried out his first solo flight on Thursday. The Civil Aviation Service Corps arrived in force on both Sundays, and all received dual. Several are on the verge of solo.

The experimental aircraft "Snark" was flown for the first time by its designer and constructor, Dr. N. de Bruyne. It is of interest to note that the machine was built throughout at Marshall's Aerodrome, and Dr. de Bruyne learned to fly with the school.

In the New Year a system of lectures on subjects pertaining to flying is being started on organised lines. It is a rule of the Cambridge Aero Club that all pupils before going solo receive at least three hours of ground instruction in maintenance and so on.

SOUTHERN

A change in the weather has led to a renewal of flying activities, and members have flown the Southern Club machine for seven hours solo. There has been no dual during the week. An extremely successful turkey supper and dance was held in the clubhouse on the 22nd.

YORKSHIRE

During the last fortnight only ten hours have been flown, but two new flying members have joined the club and one first solo has been made by Mr. P. J. Malone. A new "Puss Moth" has been acquired for the club from Mr. J. W. Rayner, bringing the number up to five, of which three are "Moths" and two "Puss Moths," which are also used for taxi work.

BROOKLANDS

Three new members joined during the week ended December 21, first solos were made by Miss Paul, Mr. Pardoe, and Miss Malcolm, and "A" licence tests passed by Major Thompson. Flying has improved with better weather.

A. H. Martin has received the Mollison Trophy for the highest marks at the Aeronautical College, and has been engaged as assistant at the R.A.F. Establishment.

CINQUE PORTS

Owing to an oversight the date for the January dance was announced as the 7th, whereas the correct date should be January 11 at 10 p.m. at the Grand Hotel, Dover.

Flying times for the past fortnight amounted to twenty-three hours, and one new member has joined.

Mr. W. E. Davis, the club manager, has left for a well-deserved holiday in Cairo, and he will be returning at the end of January, and in the meantime his place will be taken by Mr. G. B. Fellows, the assistant manager.

The club was opened for joy-riding on Boxing Day, and several parties from hotels in Folkestone took advantage of this opportunity.

The chief interest, of course, has centred around Mr. Ken Waller's magnificent return flight to the Congo.

NORFOLK AND NORWICH

The fog did its best to prevent flying last week, but there were many bright intervals in which flying was done.

On Monday, December 31, a New Year's Eve party and supper dance was held at the clubhouse at 8.30, continuing until 1.30 a.m. Apart from dancing and the usual seasonable games, the evening programme included a turkey supper at which Mr. George Roper entertained members with his Norfolk stories.

The year has passed without any accident, reflecting great credit on the chief instructor and the ground engineer. The club flew 1,040 hours—an increase of 285 on last year's total. Furthermore, twice the number of pilots have qualified. These figures, of course, were helped considerably by the Public Schools Aviation Camp which was held on the aerodrome last August when all the boys attending obtained their licences. This year the club hopes to be able to train twenty more schoolboys.

HERTS AND ESSEX

The club was closed on Christmas Day, but reopened on Boxing Day for a Christmas party and dance. In the afternoon an amusing treasure hunt was won by Mr. L. Pyle's party. At tea much fun was caused by "stump speeches," when members were called upon at a moment's notice to give a discourse on subjects ranging from "Do aerodrome officials make kind fathers?" to "The foreign policy of the Peruvian Government." Solo dances by Mrs. R. Frogley and Miss Rita Perrin, and a clever and amusing exhibition of how *not* to roller skate by Mr. George Curtis helped to make the evening a very jolly one indeed.

A carnival dance has been arranged for January 17, and an endeavour is being made to raise an amateur theatrical party to produce short plays and concerts in the clubhouse in the near future.

The "Woodside Challenge Cup" for the champion pilot of the club was won by Mr. L. F. Walters, with Mr. E. Gay as runner-up.

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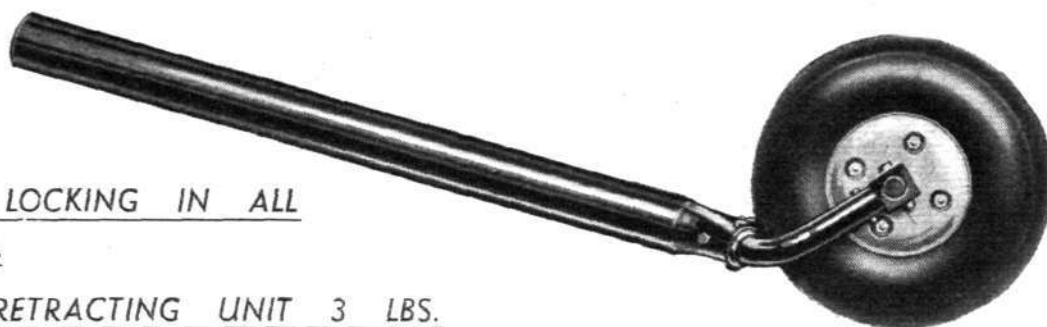
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*From the Clubs (cont.)**Private Flying***BENGAL**

The pilot-instructor was on the sick list for most of the month of November. During his absence the club employed the services of Mr. R. P. Dhargalkar, from Bombay, a very capable instructor. He learnt at Karachi under Major Jones five years ago, and took his "B" licence in England, so he was one of the very early, if not the first of, Indian pioneers in professional aviation. Most of his instructing was carried out at the Bombay Flying Club. When Major Vetch left, Mr. Dhargalkar temporarily took over his duties. Since then he has been the chief instructor of the Kathiawar Flying Club.

Dr. Galstaun, whilst in England, obtained his blind flying certificate from A.S.T., and Mr. H. I. Matthews is ready for his Indian "A-1" licence.

The utility of flying for business purposes in India was shown when Messrs. D. Keiller and T. B. Elley flew to Chaumo-

hani, near Noakhali, on November 4, in just over two hours. The journey usually takes nearly twenty-four hours. The machine used was a standard D.H. "Moth." The weather was far from favourable, raining most of the way, and the visibility very bad. A landing was made on a small maidan at Maijdee, about five miles from Chaumohani, where nearly 7,000 people had collected. It had been intended to visit Chandpur, but word was received that the landing ground was too wet for a safe landing. The next step was from Chaumohani to Dacca, a flight of roughly an hour, and then from Dacca to Calcutta, this journey taking just under two hours. During the dry season suitable places to land can be found at most up-country stations in Bengal and the use of aeroplanes for serious business transport might become more popular.

The club now has a total membership of 290, and three machines in regular use.

AN AIR SAFARI

THERE was an interesting story relating to the departure of a D.H.89 from Hatfield last week.

The particular "Rapide" had been acquired by a new firm, African Air Transport, Ltd., through Jack Barclay, Ltd., for operation on special charter in South Africa—distributing passengers from the Empire Air Terminal at Germiston—and this firm rather liked the idea of taking out a "useful load" on the delivery flight.

Before eleven o'clock on the morning on which an advertisement had been inserted in *The Times* a charter had been arranged by Safari (Africa), Ltd., a firm which organises big-game hunting trips and produces films of African life. In the 89, which is now on its way to South Africa piloted by Flt. Lt. H. N. Hawker, is Mr. C. David Philips, Managing Director of Safari (Africa), Ltd., who is travelling as far as Cairo, and Messrs. M. A. Wetherall, C. R. L. Beatty, and Billy Williams, respectively Producer, Assistant Producer, and Cameraman, who are proceeding to Tanganyika, where they intend to spend a year on film work. They propose to use air transport to take a series of pictures of Kilimanjaro, the Mountains of the Moon, and other places of interest in the African Continent. Mr. C. Davidson, an A.A.T.



The party at Hatfield before leaving for East Africa. From left to right the group consists of Messrs. Beatty and Philips, Flt. Lt. Hawker, and Messrs. Wetherall, Williams and Davidson

ground engineer, is also flying with the machine, which is, of course, being delivered eventually at Germiston airport.

A Busman's Holiday

When an order for twelve D.H. "Moth Majors" was placed with the De Havilland Company by the Spanish Ministry of War, one of the conditions was that they should be delivered before the end of the year. Only by air delivery was it possible to carry out the contract, and the question was—how?

However, Mr. G. M. Cox, one of the School instructors, promised to arrange delivery on a contract basis, and it seems that he had no difficulty in obtaining the services of twelve experienced pilots, for many of whom the trip was simply a "busman's holiday." Which only goes to show how deeply this flying bug can bite! Included among the pilots were Mr. E. S. King, a fellow-instructor of the leader, Mr. Peter De Havilland, and Mr. J. A. Harris, chief instructor of the London Club.

The "Moth Majors" reached the military aerodrome at Madrid last Sunday.

Improvements at Hanworth

The extensive alterations and improvements, foreshadowed last year, are shortly to be carried out at the London Air Park, Hanworth, at a cost of approximately £12,000. The London Air Syndicate, who have leased the aerodrome from General Aircraft, Ltd., are to proceed immediately with the erection of an additional hangar with a floor space of 12,000 square feet for the use of operating companies. Complete night flying equipment of the most modern type will enable the airport to be lit at a moment's notice.

It is expected that a school of reserve training will shortly be established at Hanworth, and plans are also being formu-

lated for the extensive development of the London Air Park Flying Club. Here a new and larger dining room and a large sun lounge are to be constructed; kitchens and other portions will be reconstructed and modernised, and most of the principal rooms will be redecorated. Two important additions will be provided by the swimming pool and squash courts. Plans are also in preparation for a series of interesting competitive events for aircraft which will be designed as an attraction to the public as well as to Club members.

Hospitality in Holland

While flying a "Puss Moth" from Hamburg to Amsterdam, Mr. L. Lipton, with Mr. W. Goldsmith, the owner of the machine, as passenger, was finally forced down approximately sixty miles from his objective.

He writes appreciatively of the treatment they received. An English-speaking gentleman, Mr. van Wely, proprietor of a local hotel, came along after the usual crowd had gathered, took Mr. Lipton on the carrier of his bicycle to find the Mayor, and logs and passports were stamped without fuss. Mr. van Wely went out of his way to make them comfortable, and they took off on the following day.

A Memorial to Flt. Lt. Binley

The Bombay Flying Club has decided to take immediate steps towards establishing such a memorial as will give an opportunity to the late Flt. Lt. Binley's many admirers and sympathisers to show in a practical way their appreciation of all that he has done for Indian aviation. No greater tribute could be paid to him than by giving immediate effect to his own scheme, and opening a Binley Memorial School of Ground Engineering.

COMMERCIAL AVIATION

— AIRLINES — AIRPORTS —

CROYDON

*Airport of Empire : Plum Pudding and Humanity Make Heavy Holiday Loads :
Railway Air Services Speed Up : The K.L.M. Accident—A Very Queer Tale*

LAST Sunday, December 30, and therefore practically welcoming the New Year, came the inauguration of the duplicated Empire air mail. Every day of the week it will be possible to see an Empire air mail loaded or unloaded at Croydon, the Airport of London, or, as perhaps we might rename it, "Croydon, the Airport of Empire."

On Sunday there will be an African mail plane inwards as well as out, and every week-day a machine will be inward or outward bound for some distant part of the Empire. In these days we are apt to awaken suddenly to find the dreams of H. G. Wells and Rudyard Kipling are realities, and to discover real significance in the motto attached to an early K.L.M. "Flying Dutchman" poster, which was: "Fiction becomes Fact." I am told that five Imperial Airways machines were in the air on different parts of Empire routes on Christmas Day, and that they were decorated and made gay for the occasion, while turkey and plum pudding were served on board. There are even rumours of a Christmas tree in one big flying boat. Ingredients for the Christmas puddings were sent out by air from England, and the crews in these remote places on the Empire's routes doubtless took an even greater interest in Yuletide ritual than did their brethren at home.

On the London-Paris services of Imperial Airways, Ltd., Christmas fare was served for a few days before Christmas and on Boxing Day; all this may have accounted for the rush of passengers which caused duplications of two services the Saturday before Christmas and of the midday Boxing Day

service of Imperial Airways to Paris. On that day *Scylla* and *Syrinx*, sister ships, flew to Paris together, both fully loaded. The two British machines, a Dutchman and a French plane all approached Paris almost at once, causing some complication owing to Q.B.I. conditions.

Railway Air Services, Ltd., have speeded up services between Croydon and Glasgow by about forty minutes, as from January 1. There is no alteration in the 10.15 a.m. departure from Croydon, but the arrival at Belfast is at 1 p.m. instead of at 1.30 p.m., while Glasgow is reached at 2.15 p.m. and not at 2.55 p.m. as in the past.

The extra speed is partly due to accelerated flying and partly to speeding up on the ground at intermediate stations. I do not know how much flying speed is lost by making the trip with the ensign flying, nor do I know the exact depreciation on each ensign per trip. It is certainly a magnificent spectacle to see a machine take off gay with bunting as I did last Sunday morning.

Last Friday Sir Alan Cobham was at Croydon with the "Airspeed Envoy." He was pointing out its merits to a significant assembly of notabilities, including Major Brackley, Wing Commr. Meadows, and Mr. Quin Harkin, secretary of Railway Air Services, Ltd.

Greatness Thrust Upon Them

Messrs. Wylie and Collins, two Australians [See photograph on p. 18.—ED.], made ready at Croydon to leave for their native land with a Monospar fitted with two Pobjoy "Niagara" engines. The machine is to be used for private air route work over there. An amusing story is told of an evening paper reporter who got into touch with these gentlemen and insisted, despite their denials, that they were out to break Scott and Black's record. Their refusal was put down to the inveterate modesty (as measured by reporters' standards) of all airmen, and they were informed that they must be out to beat the record, because it was unheard of to fly to Australia without such intention. The story of their proposed "record-breaking" flight was duly published, I am told. Thus is greatness thrust upon the unwilling.

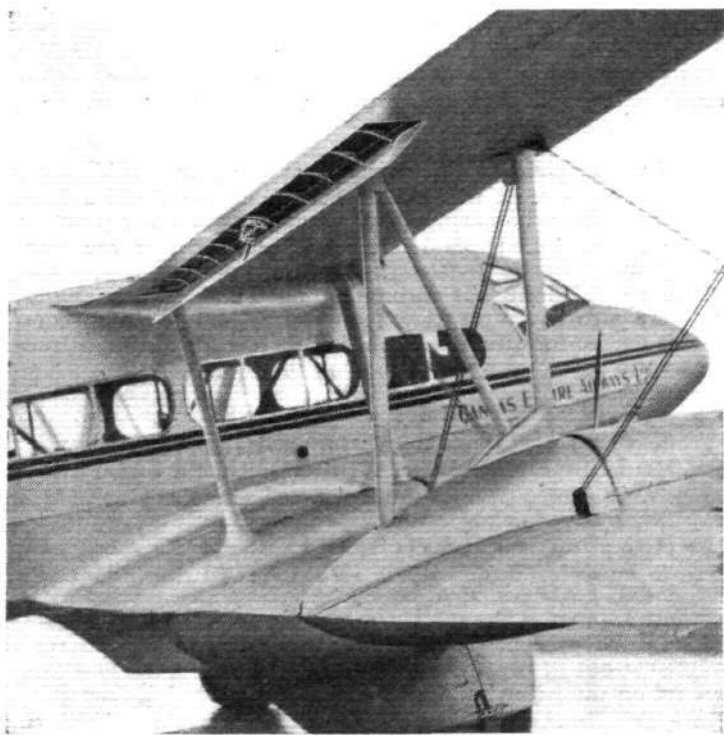
Everybody at Croydon who knew the pilots and crew of the ill-fated K.L.M. Douglas was deeply affected by the tragic news of their crash. Beekman was well known at the airport and his loss will be keenly felt amongst pilots of all nations. There was a strange incident in connection with the accident. At about 7 p.m. on the evening of the Wednesday, December 19, two foreigners, believed to be Dutch, asked a traffic hand whether the "Flying Dutchman" had yet crashed, and they repeated this enquiry to another traffic hand. They then had a cup of coffee in the main hall buffet and went away. The last message from the Douglas was at about midnight on December 19-20, and at 7 p.m. G.M.T. there was no reason for anyone to fear disaster. The story is absolutely vouched for by very reliable people and the whole thing is inexplicable.

A. VIATOR.

Guinea Gold

Some facts about New Guinea air freight-carrying given in "Gold Dust and Ashes," by an Australian author, I. L. Idriess, are positively staggering.

During 1931 no fewer than 581 tons were flown over the mountains from Lae to Lower Bulolo in a month—a greater quantity than the combined air transport companies of the world had carried in the previous twelve months. In three and a half years no fewer than twelve million pounds of cargo and 6,776 passengers were carried in 5,987 trips.



FLAPS FOR THE "EXPRESS": This photograph shows how the new split flaps, which are to be fitted to all future D.H. 86s, present considerable area to the flow. They are operated by oil pressure and the whole movement can be made in 20 seconds. The glide is steepened from 1 in 9½ at 80 m.p.h. to 1 in 6½ at 75 m.p.h. and the landing speed reduced by 5 m.p.h. (*Flight* Photograph).



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Extract from "Aeropilot," November, 1934.

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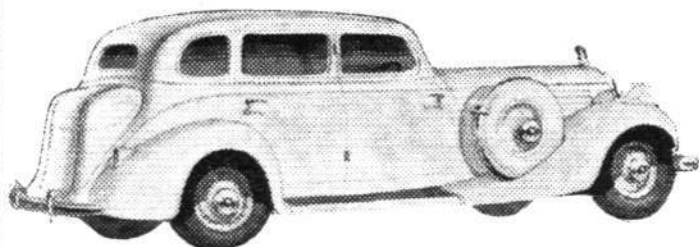
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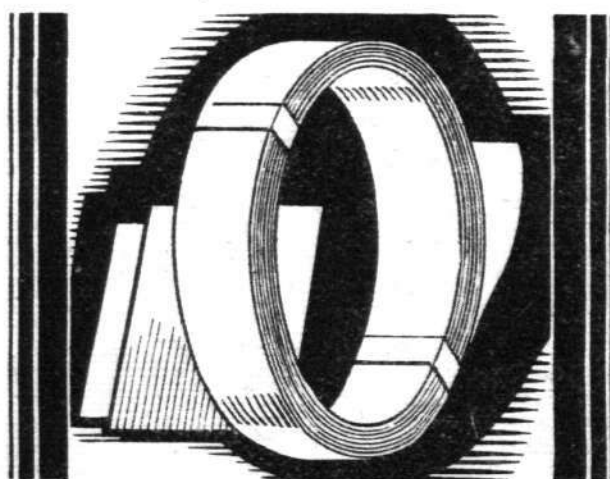
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THE PASSING OF A PIONEER

By the Death of Mr. Edward Hillman Commercial Aviation Loses One of its Most Courageous and Energetic Supporters

IT is with deep regret that *Flight* places on record the death of Mr. Edward Henry Hillman, which occurred at his home at Gidea Park on the last day of the old year. For several weeks he had been seriously ill with an internal trouble which can probably be attributed to the effects of his war service. He was only forty-five years of age, and it is particularly distressing that his death should have occurred less than a fortnight after his new company had been formed.

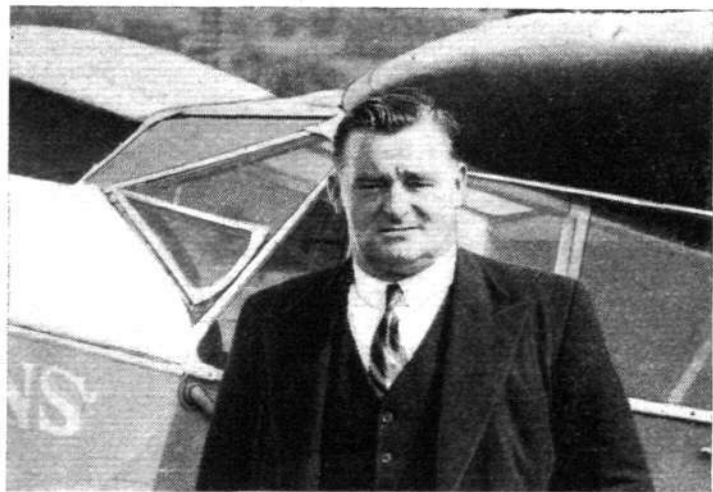
Mr. Hillman will long be remembered as one of the select few who have shown practical faith in the future of air travel and for his strong personality and pioneering spirit which triumphed over all difficulties. He entered a difficult business and was not too proud to learn from those who had had a long experience of air line operation. Few people realise that, in order to be able better to understand the difficulties of his own pilots, he himself learnt to fly, and on many occasions acted as "ferry pilot."

After difficult early years he became a cycle repairer and then started a car hire business. In 1928 he opened a coach service between Romford and Clacton, driving the coach himself. Within the next few years he became the owner of two hundred motor coaches before turning his attention to air travel.

It was natural that his first route should lie between the focal points of his first coach service—Romford and Clacton—and this line was operated successfully during the summer of 1932 with single-engined machines. He realised, however, that a special type was necessary if unsubsidised operation was to be made an economic proposition and, in co-operation with the De Havilland company, the "Dragon" came into being.

With the D.H. "Dragons" he opened a service from his aerodrome at Maylands to Le Bourget, for which the fares were low enough to attract all types of traveller in spite of the fact that the business was unsubsidised.

Last year Mr. Hillman opened a new and larger aerodrome at Stapleford Abbots, and the facilities were greatly improved. This became Essex Airport. He also picked up the threads,



The late Mr. Edward Hillman with his first "Puss Moth" at Maylands aerodrome.

which had been dropped by Midland and Scottish Air Ferries on this company's regretted departure, and opened a service to Liverpool and Belfast. This was reduced to skeleton form for the winter months, but opened again as a daily service and with an extension to Glasgow, after he had obtained the mail contract to Ireland and the north. The faster D.H.89s which he was now ordering allowed the journey to be made comfortably by daylight in all weathers.

At the time of his death, Mr. Edward Hillman had finally disposed of his motor coach interests and had turned Hillman's Airways, Ltd., into a public company, on the board of which is his son, Mr. E. A. J. Hillman, who, it is stated, will be actively concerned with the running of the business.

To the Saar

B.A.N. Co. are running a daily service between Heston and Saarbrücken during the period of the occupation. The machine leaves Heston at 7.30 a.m., and Saarbrücken at 12.30 p.m. The fares are £6 single and £10 return.

What Will Tests Show?

Visitors privileged to inspect the big Martin 130 flying boat built for Pan American Airways while it was "in the shops" speak of the craft with enthusiasm.

It is a monoplane with four 800 h.p. "Twin Wasp" fourteen-cylinder two-row radials—power plants as yet untried in regular service and for which big things are claimed. These engines are mounted forward of the leading edge of the wing, which is of riveted aluminium alloy construction with smooth stressed skin covering on the under side and corrugations, covered with a thin sheet, on top.

The hull has two steps and employs transverse frames, a "supplementary keelson" and corrugated skin on the lower and upper surfaces. Interesting features are the "seawings" which are provided instead of outboard floats or more normal "sponsons."

The cabin accommodates forty-eight passengers for day-time flying, or a lesser number, with sleeping berths, by night.

No performance figures are yet available, but it may be said that the span is 130 ft., the lifting surface, including "seawings," 2,315 sq. ft., and the gross weight 51,000 lb.

A photograph of the machine appears below.

Heavier Mails

This year's Christmas air mails to India, Australia and South Africa were the heaviest that have ever been despatched from this country, weighing no fewer than 12,807 lb. or 5½ tons, and showing a total increase of 71 per cent. Dispatches to Australia made up 1,602 lb. of this total.



FOR THE PACIFIC? The big Martin flying boat, several of which are on order for Pan American Airways, on test near Baltimore.

Commercial Aviation**HESTON***A "Centenary" : Indian National Airways' Duplication : Jersey Traffic*

THE agricultural season has arrived. The season, that is, when persistent downpours have softened, and tail-skids have damaged, the surface at Heston, and when portions of it are ploughed and resown in preparation for the summer. A hundred years ago, almost to the day, 320 acres of Heston, including the present landing area and the neighbouring land reserved for expansion, were ploughed in one seven-hour working day! One thousand and fifty horses and twenty yoke of oxen were employed in this gigantic enterprise, which provides the only centenary which Heston can honestly claim.

Airwork's associated company, Indian National Airways, will, during this year, run twice-weekly passenger and mail services between Calcutta and Rangoon, in place of their present weekly service. Their second service is scheduled to connect with the duplicated Imperial Airways service from London to Calcutta. The second of Imperial Airways weekly services runs through to Australia, calling at Rangoon. The duplicated service, however, leaving London on Tuesdays, terminates at Calcutta on the following Monday, and pas-

sengers and mails on this service may proceed to Rangoon on the following day by Indian National Airways. The return service of Indian National Airways from Rangoon will connect with the Imperial Airways service, which leaves Calcutta on Saturdays and reaches London the following Friday. In this way passengers will be able to travel twice weekly between London and Rangoon, and mail addressed to Rangoon will be delivered by air without extra charge.

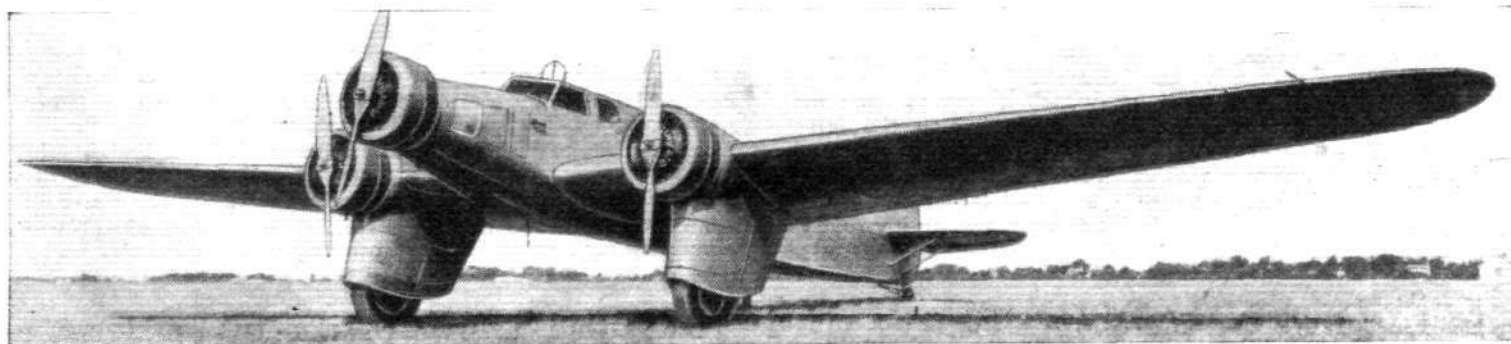
One of the "regulars" on the Heston to Jersey route is Colonel Hinde, whose wife and child, with a nurse, made the journey for the first time by air when they travelled out to join him on Boxing Day.

In the week ending December 27, forty-four passengers travelled by Jersey Airways from Heston to Jersey and fifty-eight passengers in the reverse direction.

Since the New Year the hire business which operated under the name of Wrightson Air Hire, Ltd., has been working under the altered name of Air Hire, Ltd. The Directors of the new company are Mr. R. G. Wrightson, Mr. A. G. Douglas, and Mr. C. Wrightson.

FOR AIR FRANCE

*The Dewoitine "Antares," to be put on the Far Eastern Service this year :
A Development of the Ill-fated "Emeraude"*



The new Dewoitine, a development of which may be used on the Channel services this year.

THE first of the new Dewoitine three-engined low cantilever wing monoplanes, which have been ordered by Air France for operation on its Far Eastern and other long-distance routes, has been completed and will shortly begin its trial flights. This machine, known as the "Antares," or 333, is similar in design to the ill-fated "Emeraude," but has been largely strengthened throughout. It now has a load factor of seven, an increase of two on that required by the C.I.N.A.

The "Antares" is constructed of metal throughout, and is designed to carry eight passengers, who will be seated in large reclining chairs which can be used for sleeping. There are also two large holds in which postal matter, baggage or freight can be carried.

The centre section, in which are located three tanks with a total capacity of 712 gallons, is built into, and forms part of, the fuselage. On each side of this three lateral panels are joined, and the wing structure itself consists of a main spar located about a third of the chord from the leading edge and of two intermediate spars placed at the rear end of the fuel tanks, which are installed behind the engine mountings. The spars, together with the ribs, are constructed of duralumin, and a smooth Vedal sheet metal stress-carrying covering completes the structure, which has a box form, on each side of the centre spar. The fuel tanks, incidentally, are equipped with independently operated dumping devices, and oil tanks, of 18.7 gallons capacity each, are installed behind the engine. The engine mountings are of chrome-nickel steel tubing reinforced by steel ribs.

Of monocoque construction, the fuselage is also covered with Vedal sheet, and the structure is composed of bulkhead frames and intermediate formers connected by four main spars and reinforced by stringers, all of which are made of duralumin. It is divided into three sections. The forward part contains an enclosed pilot's compartment with two side-by-side seats

equipped with dual controls. The radio operator is located behind, and a baggage hold of 24.7 cu. ft. capacity is located underneath the central oil tank. The central portion contains the cabin, which is 19.7 ft. long, 5 ft. wide and 5.7 ft. high. Behind the cabin is a lavatory. The after portion of the fuselage contains a second hold of 70 cu. ft. capacity.

The empennage is likewise of metal and is composed of spars and ribs of duralumin covered with Vedal sheet. The tail has swivel wheel attached to an oleo-pneumatic shock absorber. The cantilever undercarriage consists of two independent parts, each of which is located under one of the outboard engines. Messier shock absorbers are used and the wheels are in well-faired "trousers."

Three Hispano-Suiza nine-cylinder radial engines, type 9V, rated at 575 h.p. each, are fitted with N.A.C.A. cowlings and two-bladed Levasseur airscrews. With these engines the maximum and cruising speeds are 187.5 and 160 m.p.h. respectively, and the cruising speed at 55 per cent. of the full power is 140 m.p.h. The flight radius is 1,260 miles with normal load.

These particular engines have been considerably "stepped up" recently, and it is understood that the latest types deliver something like 700 h.p., so an improvement in performance may be expected if they are fitted.

Another development of the "Antares" is being constructed to carry 30 passengers, and it is possible that this D.620 type, as it is known, will be used on the cross-Channel service this year.

A South Atlantic "Record"

Last week's return flight of the German South Atlantic air mail service beat all records when the Heinkel used on the last leg of the route reached Frankfurt-on-Main twenty-four hours before its normal schedule.

A MAIL-CARRIER WANTED

A TYPE of transport machine designed for carrying mails under night flying conditions is more than likely to be suitable, after small modifications, for general work in Europe's difficult winter weather conditions.

A.B. Aerotransport have recently produced a very complete specification for a night mail machine, and there are at least possibilities that the four machines required will be made in this country. Certainly, after the company's troubles with American craft—their second Northrop had to be sent all the way to the States for attention after a heavy landing—they are not likely to buy again out of Europe. If, therefore, this night mail type is produced here, the design will provide at least a basis for other types.

In general, the suggested machine follows Lockheed "Electra" and Boeing 247 lines, but it is stipulated that the wing loading shall be limited to 16.3 lb. per sq. ft., so that there will be a low sinking speed at the stall, and that the landing gear (which may be either fixed or retractable) shall be strong and be capable of taking the effects of a full stall landing.

Naturally, a very high operating speed is not expected, but

this must be guaranteed at 160 m.p.h. using 75 per cent. full power, with two Pratt and Whitney "Wasp" 81H1 engines or English engines of a similar power. Three-bladed Hamilton controllable pitch airscrews are to be fitted, and the engines, with their accessories, must be quickly detachable. A five-hour cruising range with normal load is expected, and the aluminium tanks must have dump valves.

The fuselage must have two freight compartments having a total capacity of 250 cub. ft., and the cockpit is to be placed above the centre of the low wing with an unobstructed forward view. Wing flaps, or similar high lift devices, may be used to reduce the approach and landing speed, which is estimated, for a provisional layout, at 62 m.p.h. Among the various estimated figures the payload is given as 1,400 lb., and the gross weight as 12,000 lb., with a useful load of 4,170 lb.

The special equipment must include a Sperry Horizon, a Directional Gyro, a Pioneer Turn Indicator, a sensitive altimeter, an ice-warning indicator, a Zeiss retractable landing light for the left wing, two-way radio, and complete Goodrich De-icer equipment.

Jersey Airways First Year

Last week Jersey Airways completed its first year of service. Something like 20,000 passengers have been carried and 1,500 crossings made without loss. Their new 86s have, incidentally, been given their registration letters.

Karachi-Madras Change

The route followed by Tata's mail service from Karachi to Madras has been changed since January 1. The intermediate stopping place is Hyderabad (Deccan) and not Bellary. The Nizam's Government has agreed to give a subsidy of about Rs. 20,000 yearly, and to provide other facilities.

The Madras-Colombo Air Mail

The air mail service between Madras and Colombo will be inaugurated early this year. The distance between the two cities, about 450 miles, will be covered in less than five hours.

For more than a year Tata's have been contemplating the extension of the Karachi-Madras air mail route to Colombo, but the lack of a suitable landing ground in the vicinity of Colombo necessitated its postponement. At one time it was even suggested that a seaplane might be used.

The Colombo aerodrome, which is about six miles from the city, has now been completed. Tata's have decided to fly the mail in a single "hop" from Madras to Colombo, using the aerodrome at Dhanushkoti as an emergency landing ground.

In order to come into line with Imperial Airways it is possible that they will double their services, and they are also understood to be contemplating air services to certain important hill stations in India and Ceylon using Autogiros. It is possible, incidentally, that their new Miles "Falcon" will reach India in time to be used on the Colombo service.

The K.L.M. Tragedy

Although it will be some considerable time before the results of the official enquiry on the accident to the Douglas are published, several facts have come to light since the arrival of the technical experts by air from Amsterdam.

It appears that the machine was definitely struck by lightning, and medical evidence also suggests that the seven victims of the tragedy were all killed by the same discharge. There was no indication of structural failure, and the machine had undoubtedly flown into the ground. The flares had not been used, the searchlight contacts were off, the wheels and flaps were in flying position, the trimming flaps were neutral, the throttles were open, and the engine switches were on.

The trailing aerial had been wound in, but there were local marks of intense heat in the region of the fixed aerial attachments, though only the tail and the rear part of the cabin escaped the ravages of the petrol fire.

Beckman, the commander, was an extremely careful pilot with more than 70,000 hours to his credit, and the weather reports were such that no one of experience would have hesitated to start for Baghdad. However, two different currents appear to have caused an exceptionally violent thunderstorm.

The Fokker F.22

Final tests of the first four-engined Fokker F.22 have been successfully carried out. This machine—virtually a smaller version of the F.36, which was demonstrated in England last year—has been built for the Swedish A.B. Aerotransport, and will be put in service on the Scandinavian Air Express route after it has been demonstrated in this country.

Opening the Iraq Pipe Line

The Iraq Petroleum Company has chartered *Syrinx* from Imperial Airways to transport their officials to Iraq for the opening of the pipe line, which runs across the desert from the Iraq oil fields to the coast. Sir Robert Waley Cohen will leave in this machine with the other passengers on January 5. Opening ceremonies will take place at Kirkuk, Damascus, Tripoli (Syria), Haifa and Amman.

New German Airship Base

The Zeppelin Company has applied to the German Air Ministry for permission to run its services from Frankfurt-on-Main and to reserve the base at Friedrichshaven for constructional purposes. The new base will be known as Rhine-Main port and will be ready for the 1936 season.

Apart from the fact that it is 1,000 ft. lower than the original and famous base, Frankfurt has several very definite advantages, the most important being its convenience of access.

Meanwhile, the Pacific Air Transport Company, the joint Japan-Manchukuo concern mentioned in *Flight* of November 22, is to purchase rigids from the Zeppelin Company. The dailies suggested that beans would be used as payment; maybe, but the fact is about as remarkable as the trading of Old Masters for chewing gum *via* the international exchange—all trade being barter and gold being merely a token of exchange.

Kicking the Bucket!

Britain's premier airport, the London Terminal Aerodrome, Croydon, has, in the roof of the palatial main hall, a hole which has been there for two years at least. The powerful Air Ministry department dealing with such matters is understood to have the situation well in hand and to be giving it continuous earnest consideration.

It is probably beneath departmental dignity to descend to such mundane methods as stopping the hole up with a morsel of mortar or even with a well-fitting cork, and the method which has been in vogue for the last few years is to pretend there is no hole when the sun shines, and to place a zinc pail beneath it on wet days.

This pail stands sturdily in the path of the busiest pedestrian traffic of the main hall, and tinkles pleasantly as the rain descends into it. Ancient employees of the airport use it to make rough estimates of the rainfall, and to extinguish cigarettes. They have learned, by years of experience, not to put their foot in it.

Not so the guileless passenger who may occasionally be seen performing a perfect indoor loop with the clattering Government property on one of his feet and its contents soaking into his system. Nobody expects the department concerned to do anything about the matter until somebody breaks a leg, at least.

AIR POST STAMPS

By DOUGLAS B. ARMSTRONG

(Editor of "Stamp Collecting," etc.)

Australia's New Air Stamp

SOME thousands of letters brought from Australia to England by the first Christmas air mail and delivered in London on Christmas Eve, 1934, were franked with a new Australian air mail stamp provided for the occasion by the Commonwealth post office on or about December 8. Printed in a rich plum colour and engraved in traverse rectangular format, it bears a figure of Mercury (after the statue by Giovanni da Bologna) between two hemispheres. The face value, 1s. 6d., is indicated in figures repeated upon either side of the two-line inscription, "Postage AUSTRALIA," but, curiously enough, the words "Air Mail" are conspicuous by their absence, although it is hard to see for what other postal purposes a stamp of that denomination could be used.

Besides the novel stamp most of the Yuletide air mail letters from Down Under were enclosed in souvenir envelopes prepared by Imperial Airways and Qantas Airways for the occasion, and showing in a panel on the left-hand side a bounding kangaroo upon an outline map of Australia, with an aeroplane in flight beneath an appropriate inscription to indicate that the letter had been carried on the inaugural flight of the new Australia-England service.

Official figures are now available regarding the mail carried by the Royal Dutch air liner in the London-Melbourne air race, which was, in point of fact, the only official air mail carried. Out of a total of 35,000 letters delivered by Parmentier and Moll, 17,000 were redirected to Holland for return to the senders. Application for permission to carry a mail on the return flight was refused by the Commonwealth postal authorities.

Rocket Mails

It is reported that permission has been granted by the French Air Ministry for a rocket post experiment to be carried out between Calais and Dover in the present year. Presumably this will add further varieties to the already existing labels associated with the ill-fated rocket post of Herr Zucker.

A Study in Contrasts

If the proposed air post stamps for the Bahamas ever materialises they will afford a curious study in contrasts, the subject chosen for representation thereon being an underseas photograph taken by the American photographer Mr. J. Williamson, with the head of King George inset. Proofs are said to have been prepared by Waterlow and Sons, the well-known London stamp engravers, but it is understood that the issue has yet to be finally approved.

Air Mail Society

The Dowager Viscountess Downe has accepted the presidency of the newly constituted Air Mail Society, with Col. G. R. Crouch and Miss W. Penn Gaskell as vice-presidents. An executive committee has been formed consisting of Messrs. R. E. R. Dalwick, D. B. Armstrong, C. H. Greenwood, C. C. Harmer, J. S. Davis, A. Phillips, A. G. Thompson, Dr. F. J. Whitelaw, and R. Harker (hon. secretary and treasurer), Stonea, Bulls Moor Lane, Waltham Cross, Herts. An expert committee is also in formation. The annual subscription has been fixed at 5s., and the enrolment of members is proceeding apace.

New Issues

In addition to those issued by the Italian post office for the purpose of the special air mail flown from Rome to Mogadiscio in connection with the visit of King Victor Emmanuel to Italian Somaliland, each of the Italian colonies was provided with a similar issue. In the case of Somaliland this comprised no fewer than twelve denominations ranging from 25c. to 25 lire adorned with a medallion head of the King of Italy and carrying a surcharge in each instance. Eritrea, Cyrenacia and Tripolitania, on the other hand, were each content with a solitary air mail stamp of 25 x 2 lire whereon figured portraits of His Majesty in a variety of uniforms and settings.

The Central European Principality of Lichtenstein has just issued the forerunner of a new series of air mail stamps in the design of an eagle perched upon a rock, by the Viennese artist Ludwig Heshshaimer and printed in photogravure by the firm of



One of the covers received in London on Christmas Eve by the first Christmas air mail from Australia via the new Empire service. It is franked with the new Australian air mail stamp.

Courvoisier at Chaux-de-Fonds: denomination 5 rappen, colour green.

From the Dominican Republic comes a new 10 centavos air mail stamp adapted from the ordinary postage stamps commemorating the opening of the Trujillo Bridge by the inclusion of an aeroplane flying over the bridge and the words "Correo Aereo" in small type.

COMPANY MEETING

The Fairey Aviation Co., Ltd.—A profit of £47,534 2s. 4d.—a fall of £69,148 12s. 3d. from the preceding year—was announced at the sixth ordinary general meeting of the Fairey Aviation Co., Ltd., held on Monday. Mr. C. R. Fairey, the Chairman, explained that this fall in profits was due to a further shrinkage in the turnover of business with the Air Ministry. A considerable part of the company's activities, he added, had been in connection with its export trade. He expressed the hope that the time would come when production for the Air Ministry would be planned over a period of years, thus ensuring greater continuity of production and a more stable industry.

NEW COMPANIES

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PUBLICATIONS RECEIVED

Aeronautical Research Committee Reports and Memoranda. No. 1598. The Landing of Aeroplanes. Part I. By R. P. Alston. Part II. By L. W. Bryant and I. M. W. Jones. June, 1934. Price 1s. 3d. net.

Aeronautical Research Committee Reports and Memoranda. No. 1599. Resistance of Certain Strut Forms. By R. Warden. March, 1934. Price 1s. 9d. net. London: H.M. Stationery Office, W.C.2.

Aeronautical Research Committee Reports and Memoranda. No. 1618. Wind Tunnel Tests on a Model Gloster Troop Carrier. By W. G. A. Perring and C. Callen. October, 1930. Price 1/- net. London: H.M. Stationery Office, W.C.2.

Jane's All the World's Aircraft, 1934. Edited by C. G. Grey. Price £2 2s. 0d. net. London: Sampson Low, Marston & Co., Ltd.

Aerodynamic Theory. Volume II. General Aerodynamic Theory—Perfect Fluids. Editor-in-Chief, W. F. Durand. Price 20 Rm. Berlin: Julius Springer, Linkstrasse 23-24.

AERONAUTICAL PATENT SPECIFICATIONS

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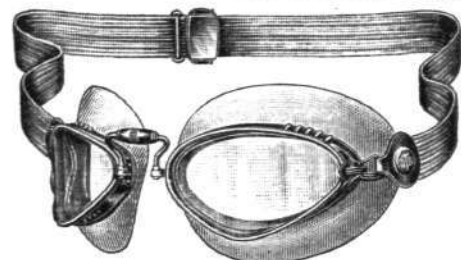
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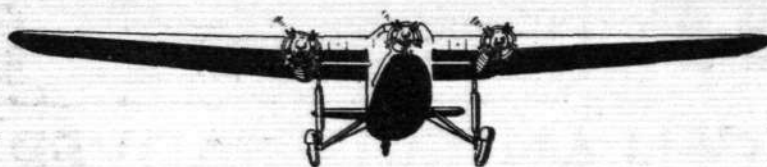
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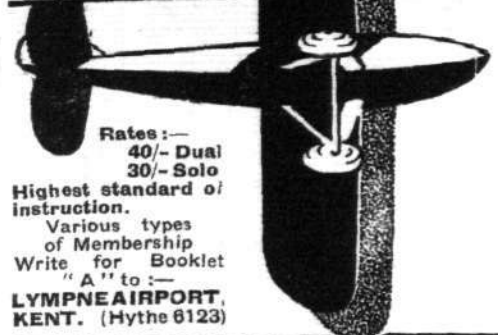
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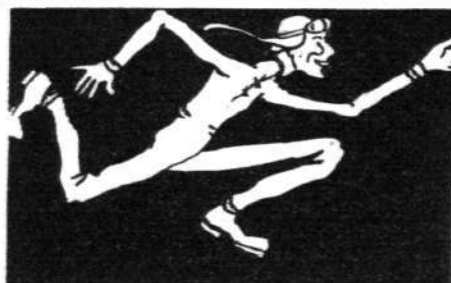
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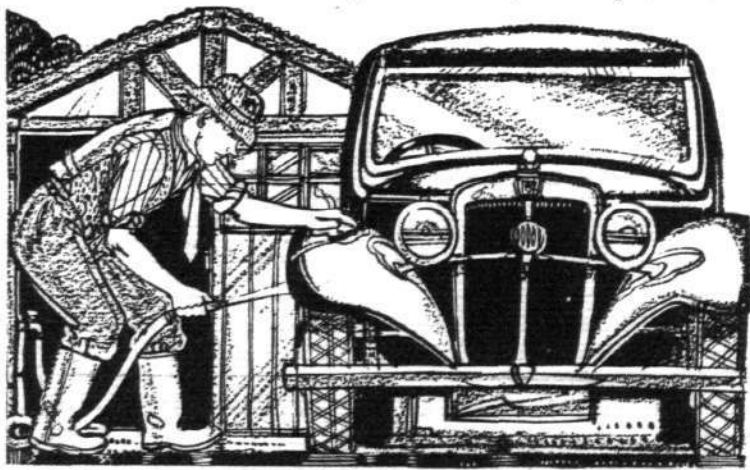
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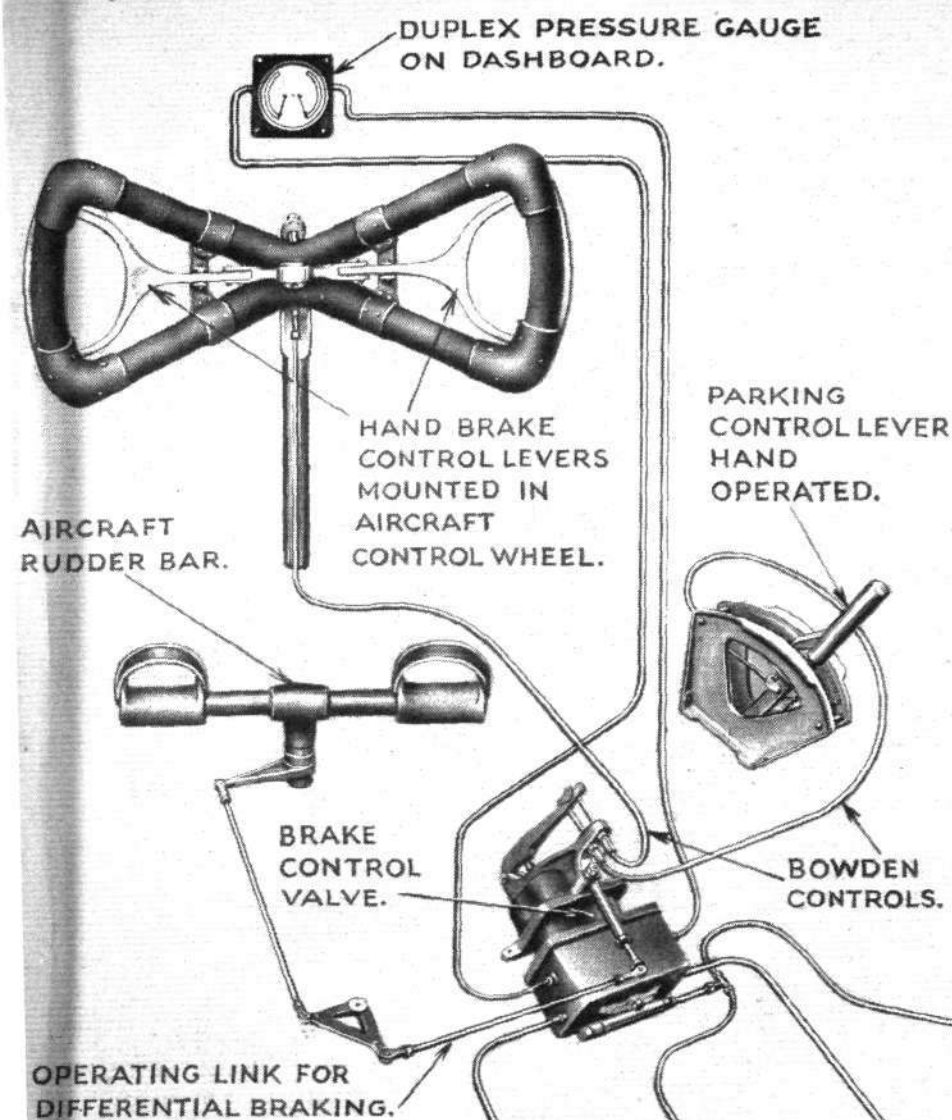
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